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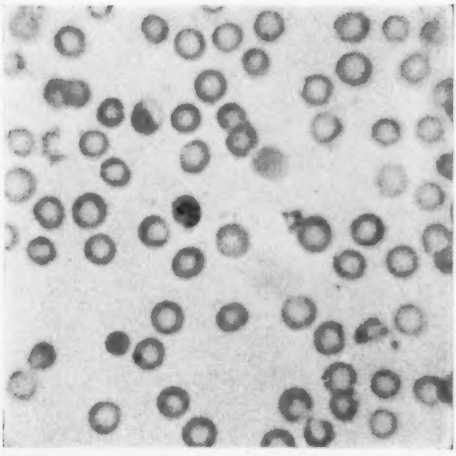
Journal

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION



Photomicrograph of stained blood smear from dog with babesiasis.
Page 635

Vol. 138 June 15, 1961 No. 12

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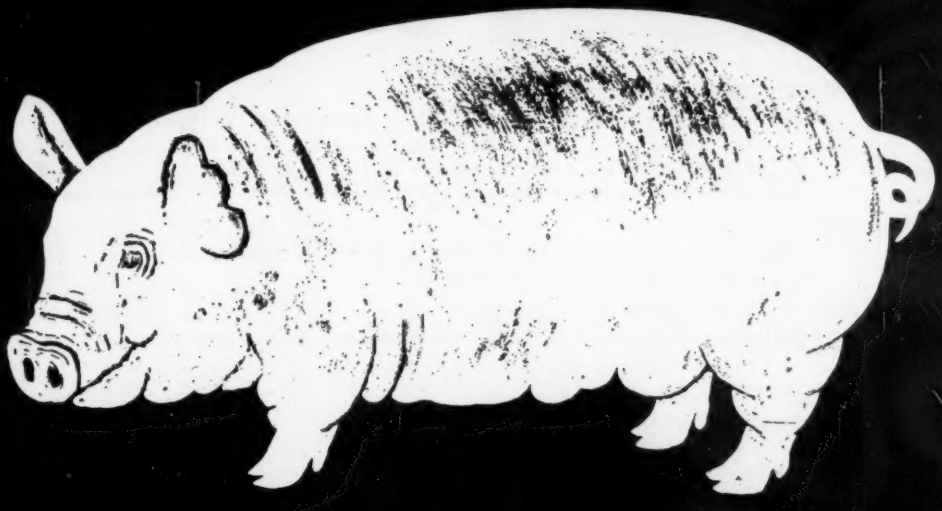

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OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Vol. 138 No. 12 June 15, 1961

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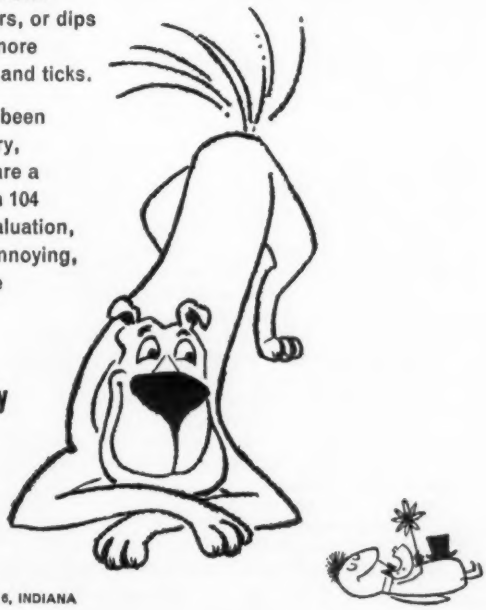

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Correspondence

April 25, 1961

Dear Sir:

A report on veterinary medicine in South America in the Feb. 15, 1961, issue of the JOURNAL of the American Veterinary Medical Association by Dr. M. G. Fincher, was called to my attention recently when I arrived in Bogota, Colombia, to consult with public health and veterinary people on leptospirosis.

In Dr. Fincher's report, he states: "Apparently, virus diarrhea and leptospirosis are not recognized in South America and may not exist there. No one knows, but South American veterinarians are looking for them."

I have recently returned from a 4 months' assignment with the Pan American Sanitary Bureau as consultant on leptospirosis to the Pan American Zoonosis Center in Azul, Argentina. While in South America, I visited with public health, medical, veterinary, and agriculture groups in Brazil, Argentina, Chile, Peru, and Colombia. The disease has been recognized for many years, as may be seen in the review of leptospirosis in Latin America, published by Alexander in the World Health Organization Bulletin 23:113-125, 1960, in which he cites more than a hundred references. At least 5 different leptospiral serotypes have been isolated from man and domestic animals in South America, and serologic evidence suggests infections with several other serotypes.

In February, 1961, I assisted the staff at the Pan American Zoonosis Center in presenting a 2 weeks' course on laboratory methods in the diagnosis of leptospirosis. The 10 participants in this course came from health departments, veterinary schools, or national departments of agriculture and livestock in Argentina, Brazil, and Chile. There is a growing concern, particularly in Argentina, Chile, and Peru, regarding the prevalence of leptospirosis in cattle. A recent report from Chile describes 110 cases in man confirmed during the past 4 years.

While I found it is true that in some areas little or no investigative work is currently in progress, no diagnostic service is available, and our knowledge of the disease in these areas is scanty or lacking, I am at a loss to understand why Dr. Fincher apparently did not hear about some of these problems and concluded that leptospirosis appeared not to exist in South America.

s/MILDRED M. GALTON, *Chief*
Veterinary Public Health, Laboratory Unit
Dept. of Health, Education, and Welfare
Atlanta, Georgia

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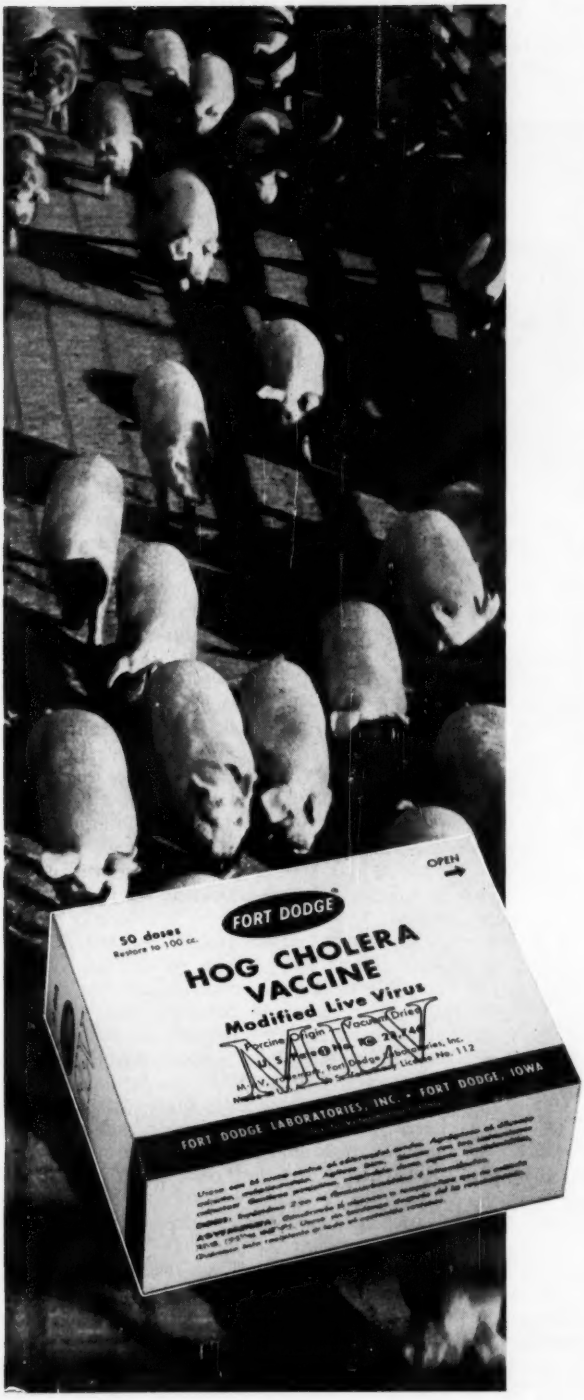

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Location of Veterinary Hospitals

The location of a veterinary hospital is important to the owner and the public.

Too often, animal hospitals built in the country some years ago are "downtown" today, due to the expansion of city boundaries. In some instances, values have inflated to compensate the owner. It would not be possible to build a veterinary hospital in the same location today due to zoning or other restrictions.

Dr. Mark L. Morris, President-Elect

Regional planning and zoning commissions commonly establish long-range programs with well-defined building restrictions applying to suburban areas surrounding modern cities. The location of a hospital convenient to the animal-owning public, therefore, becomes increasingly difficult.

The American Animal Hospital Association has been aware of this problem. Zoning for animal hospitals was discussed at the joint meeting of the officers of the American Animal Hospital Association and the American Veterinary Medical Association in St. Louis in April. Dr. W. R. Riser, who was president of the AAHA at that time, observed that often the veterinarians themselves have been responsible for precipitating zoning restrictions. He indicated that the causes are multiple. The term "veterinary hospital" and "boarding kennel" are often considered synonymous. Construction sometimes is of unsightly, poor materials. Outside exercising yards contribute to noise from barking dogs, to odors, and to an undesirable appearance. Outdoor incinerators for disposing of wastes are objectionable.

The hospital owner may take the position that he was there first, and that when residents moved nearby they realized a hospital was there. Consequently, the hospital owner should not be liable for complaints. Such disagreements sometimes reach the courts and become a matter of public record. This, with attendant news publicity, leads to an undesirable image of the veterinarian and his hospital in the public eye.

It is desirable to locate a hospital or clinic in an area zoned "commercial." These locations are usually convenient to residential areas where people keep pet animals. It is unfortunate when restrictions force well-constructed and efficiently operated hospitals to locate in "industrial" areas. The animal-owning client finds industrial locations inconvenient, especially at night when it may be necessary to drive through a poorly patrolled or poorly lighted area. Providing for a safely and conveniently located hospital is the responsibility of the veterinary practitioners, most of whom are members of the AVMA.

This is a problem, national in scope, requiring the joint efforts of the AVMA and the AAHA and all practicing veterinarians. A tentative program is being prepared to include the establishment of technical guidelines for veterinarians contemplating construction of a hospital. Information on modern construction and operation should be available to veterinary students. In addition, detailed information on modern construction and location of veterinary hospitals should be provided to architects, construction engineers, planning or zoning boards, and other government officials. This is a long-range assignment, as it involves the re-education of public officials.

Dr. Riser has suggested that the profession defend its position so that it will be possible to have a small animal hospital in any area approved for automobile service stations or cleaning establishments. Veterinarians should help persons planning suburban areas in drawing up regulations.

An effort should be made to see that, early in the planning of a suburb, the small animal hospital will be properly recognized in the zoning code and given an opportunity to identify itself in a community. It becomes mandatory, therefore, that the local veterinarian identify himself more intimately with local government and community affairs if the objectives of this program are to be attained.

Mark L. Morris

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Select list of Anaplasmosis references

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J. A. McCallam, VMD
Brig. Gen. USA (Ret.)

LEGISLATION

Pension Plan for Self-Employed

H.R. 10, to authorize voluntary pension plan for self-employed. Bill was passed by House, now goes to Senate Finance Committee (see JOURNAL, April 1, 1961, adv. p. 12).

HEW Budget

H.R. 7035—Department of Health, Education and Welfare 1962 budget totaling $4,020,134,000, was passed by the House May 17. Budget would be $150,000,000 more than last year's appropriation and $48,000,000 more than requested by the President. Among items included are: Food and Drug Administration, $25,330,000, of which $1,750,000 would be for a pharmacology animal laboratory building; P.H.S., $1,123,180,000, with $641,000,000 earmarked for National Institutes of Health.

NEW BILLS

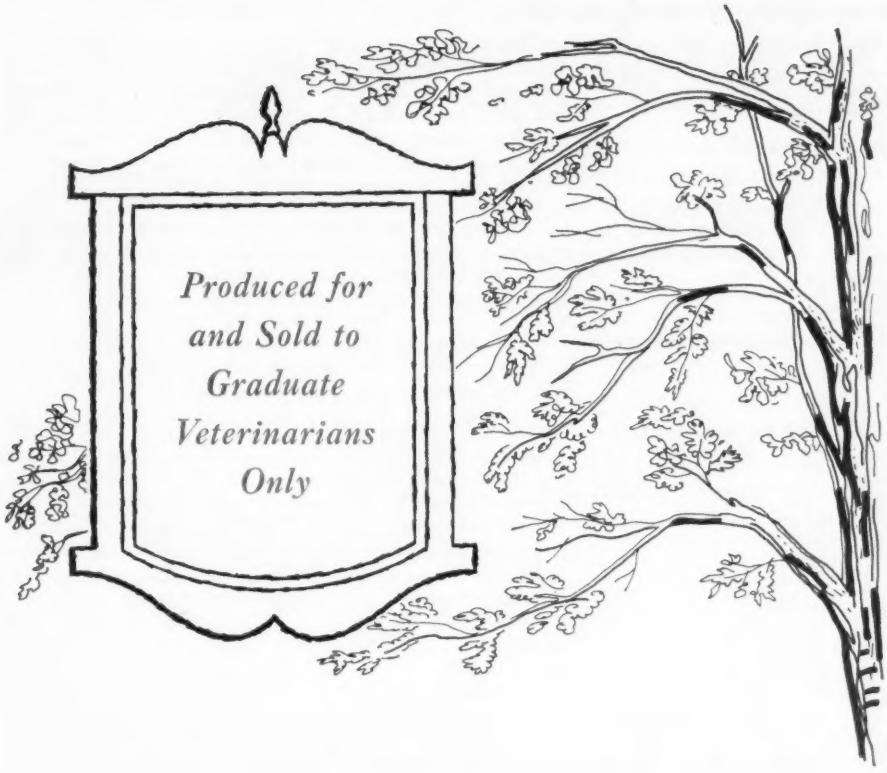
USDA Budget Increases

The President transmitted to Congress amendments to the USDA budget for fiscal 1962, including increases for the following: plant and animal disease and pest control, $345,000; meat inspection, $415,000; poultry inspection, $500,000. (see JOURNAL Feb. 15, 1961, adv. p. 12, for original estimates). Revised standards will be issued by the Civil Service Commission about July 1, 1961, and will be mandatory under the Classification Act of 1949. The increases result from a reclassification of veterinary positions in the areas cited, prompted by the study made by C. S. C. and requested in AVMA Resolution No. 16, 97th Annual Meeting, Denver, Colo., August, 1960 (see "*Proceedings of the Business Sessions,*" p. 94; also JOURNAL Dec. 1, 1960, adv. p. 14).

Hog Cholera Eradication

S. 1908, Sen. Talmadge, Hickenlooper, Mundt, Young (N. Dak.), Hart, Eastland, Holland, and McCarthy; *H.R. 7176,* Rep. Grant (D., Ga.); and *H.R. 7177,* Rep. Harvey (R., Ind.) —Identical bills to provide for a national hog cholera eradication program (see p. 677, this JOURNAL). Program would be directed by the Secretary of Agriculture in cooperation with the several states, and would prohibit or restrict (by the authority of the amended Act of February 1903, section 2) the interstate movement of virulent hog cholera virus or other hog cholera virus to the extent necessary for eradi-

(Continued on adv. page 14)



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Federal Payment of Research Costs

H.R. 6984, Rep. (Mrs.) Hansen (D., Wash.)—To provide a method of payment for indirect costs of research and development contracted by the federal government at universities, colleges, and other educational institutions.

Moisture Conservation Research

S. 1854, Sen. Allott and Carroll (R. and D., Colo.)—To establish a moisture conservation research center at the federal land-grant college at Fort Collins, Colo.

Berry Plan for Veterinarians

Extension of the Berry plan to include veterinarians is being considered by National Headquarters of Selective Service and the Department of Defense, at the request of AVMA. Plan is designed to obtain specialized physicians and dentists for the Armed Forces. A limited number of veterinary graduates would be commissioned in the Veterinary Corps Reserve of the Army or Air Force, and deferred from active duty until completion of postgraduate training at personal expense in civilian institutions, in order that the needs of the military services for specially trained veterinarians may be met.

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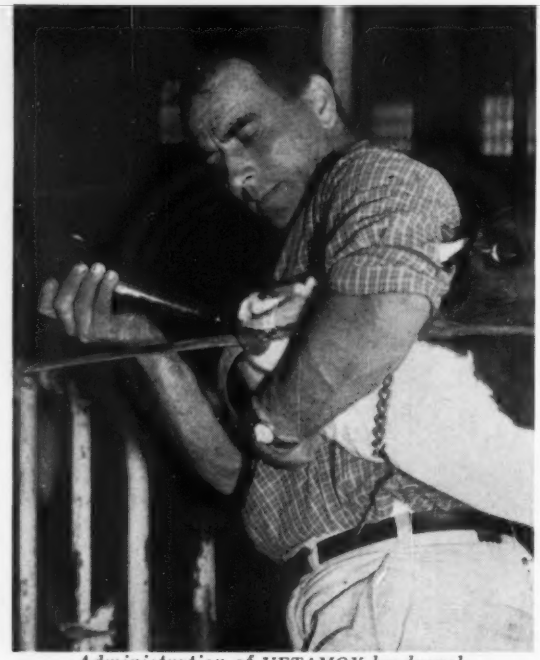

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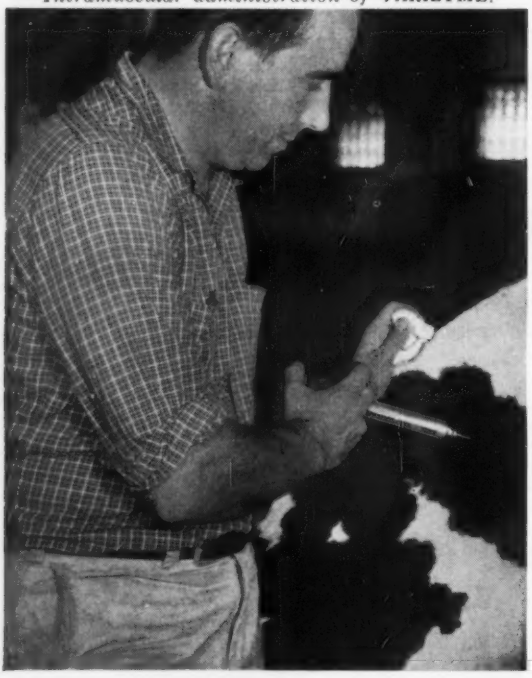

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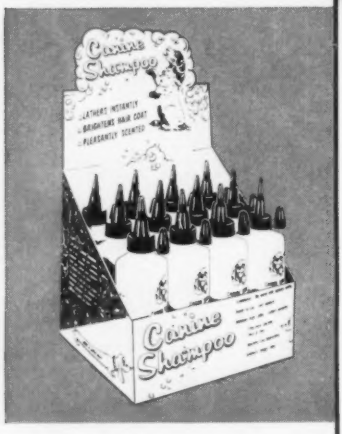

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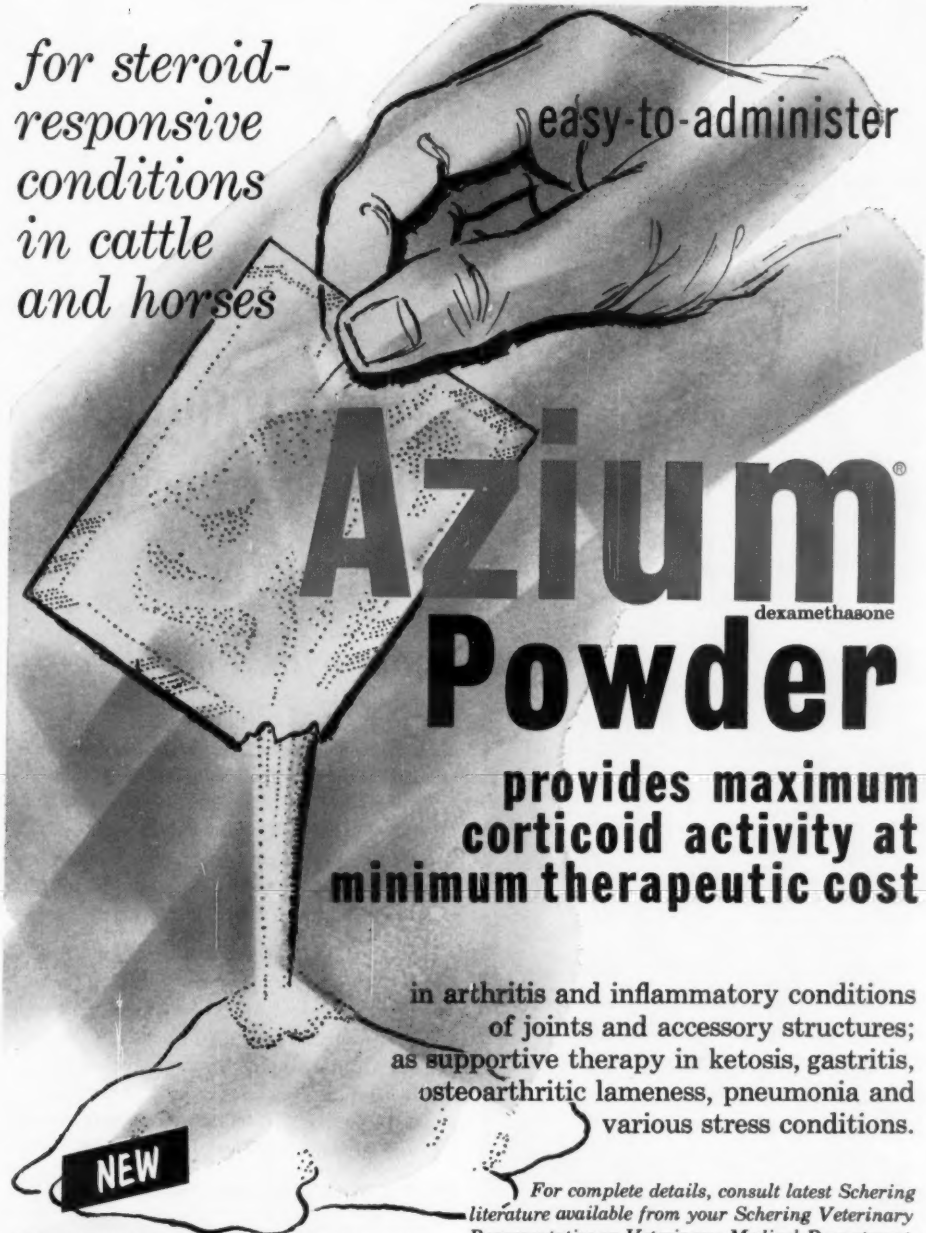

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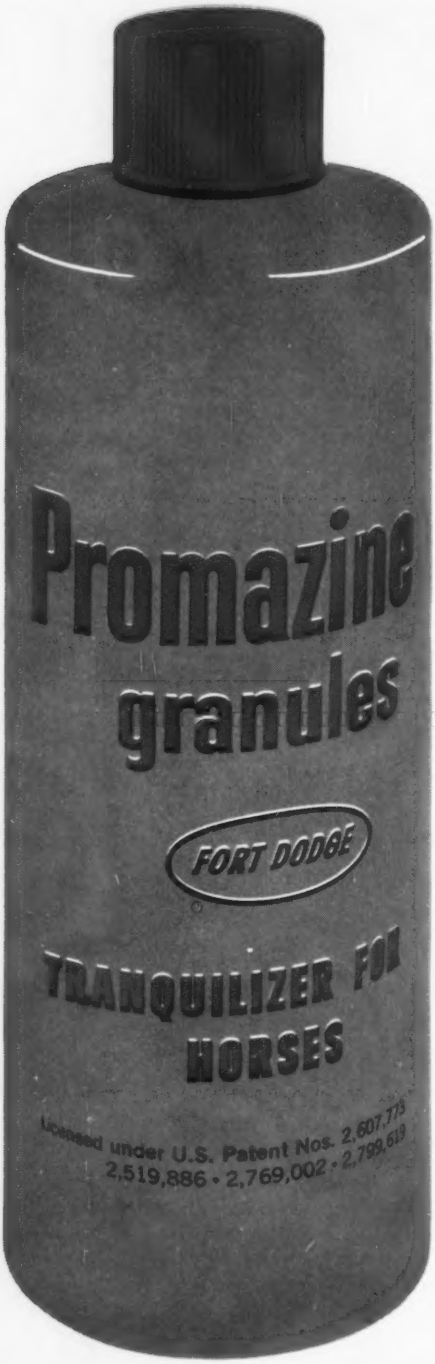

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Canine Babesiasis (Piroplasmosis) —A Case Report

Ned W. Rokey, D.V.M., B.S., and Ray Russell, D.V.M., B.S.

CANINE BABESIASIS (canine piroplasmosis), reported only infrequently in this country, was diagnosed in a pack of lion hounds in the Phoenix area. A blood protozoan, tentatively identified as *Babesia canis*,[6] was assumed to be the causative agent of a vague disease syndrome in the pack. Diagnosis was confirmed by inoculation of a splenectomized pup. Observations and studies made on this pack of hounds are reported here.

History

Although occurring only infrequently in the United States,[9] *B. canis* apparently has world-wide distribution. It has been reported in Africa, Asia, Brazil, Europe, Puerto Rico, and the Panama Canal Zone.[4,5] According to one authority,[5] this condition probably affected dogs in South Africa during the greater part of the 19th century.

In 1934[2] and 1937,[10] canine babesiasis was reported in Florida dogs and, more recently, in other parts of the United States.[3,8,11]

Methods

Standard bacteriologic methods were used. Tissue sections were stained with hematoxylin-eosin and by Giemsa's method. Blood smears were fixed in absolute methyl alcohol for 2 minutes and stained in diluted* Giemsa's stain for 45 minutes. Serologic tests were conducted with *Leptospira pomona*, *Leptospira icterohaemorrhagiae*, and *Leptospira canicola* antigens. No attempt was made to identify viral agents.

Case History

On Jan. 31, 1959, a Bluetick Coonhound bitch, 6 years old was brought to the coauthor's (R.R.) veterinary hospital for

Dr. Rokey is associate pathologist in charge of the University of Arizona Animal Pathology Laboratory, Mesa, and Dr. Russell is small animal practitioner in Mesa.

Arizona Agricultural Experiment Station technical paper No. 630.

The authors thank L. W. Dewhirst, parasitologist, Animal Pathology Department, University of Arizona, Tucson, and Professor M. W. Henning, Universiteit van Pretoria, Pretoria, South Africa, for their assistance in identification of Babesia canis; and Glen M. Kohls, sanitarian director, Rocky Mountain Laboratories, Hamilton, Mont., for final identification of Rhipicephalus sanguineus.

*Giemsa's stain was prepared according to manufacturer's directions. One drop of stain was diluted to 1 ml. of buffered distilled water.

Fig. 1—A 6-year-old Bluetick Coonhound bitch with chronic babesiasis.

treatment. The bitch was one of a pack of 18 lion hounds. Her condition was poor (Fig. 1), and she had been under treatment and observation for several months. Previously, symptomatic treatment and rest had apparently alleviated the condition; however, when the bitch was put back to work the condition would recur.

Clinical signs were a severe cough, laryngitis, enlarged tonsils, congested sclera, slight icterus, mild anemia, and a body temperature of 103.5 F. Treatment consisted of whole blood transfusions, tetracycline (i.v.), and B-complex vitamin injections. After a tentative laboratory diagnosis of babesiasis, 1% trypan blue was given intravenously. There was little response to treatment. The bitch developed central nervous disturbances manifested by clonicotonic convulsions and fetid diarrhea. She died 3 days later.

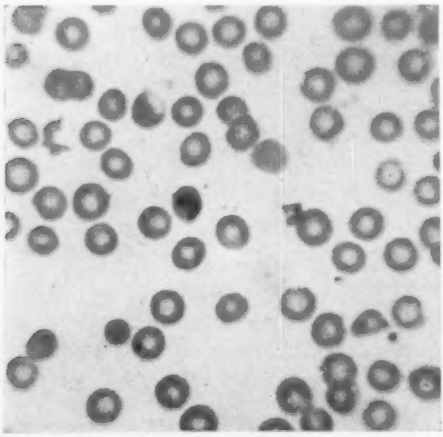

Fig. 2—Photomicrograph of stained blood smear in which the red blood cells are parasitized.

Results

Examination of stained blood slides from the bitch revealed characteristic, paired, purple-staining intracellular inclusion bodies in the red blood cells. These paired inclusion bodies were teardrop shaped (Fig. 2), with a slight curvature toward the apices. They were connected with a fine acidophilic chromatin band. Acidophilic staining granules were observed in the basal portions. The organism measured approximately 3 μ at the base and was approximately 5 μ in length. In some instances, as many as 4 inclusion bodies were observed within one red blood cell. Only occasionally was the organism observed extracellularly.

The hemogram revealed a PCV of 14%. A definite macrocytic anemia was evident. Approximately 10% of the erythrocytes had polychromic staining. There were 12,850 WBC's. Polymorphonuclear cells predominated. There was no apparent increase of eosinophils.

Necropsy was performed approximately 3 hours following death. The peripheral lymph nodes were approximately 3 times normal size and were hemorrhagic. The intestinal tract also was hemorrhagic. Peyers' patches were grossly enlarged. The liver was normal in size and consistency; however, it had yellow discoloration. The kidneys had extensive areas of scarification. The spleen was enlarged and thickened. Mucous membranes and adipose tissues were yellow-gray.

On bacteriologic examination of brain, liver, and prescapular lymph nodes, only *Proteus spp.* organisms were found.

On histologic examination of stained tissue sections, there was evidence of severe interstitial nephritis. Characteristic pathologic processes of babesiasis could not be demonstrated in any of the tissue sections, nor could *B. canis* be demonstrated in sections stained with hemotoxylin-eosin or by Giemsa's method.

From each of the 17 remaining hounds in the pack, 2 ml. of citrated blood was collected. Direct smears were also made from each hound. On examination of stained direct blood slides, we found that another

hound in the pack was harboring *B. canis*. Erythrocytic hyperchromasia was evident in 3 more hounds, but *Babesia* organisms could not be demonstrated. However, when citrated blood samples were centrifuged and the top layer of erythrocytes removed and stained, a 2nd hound was found to be parasitized. The 2 parasitized hounds had no apparent clinical signs and seemed healthy.

Serologic tests for *L. pomona*, *L. icterohaemorrhagiae*, and *L. canicola* were negative.

Experimental Findings

A splenectomized 6-week-old pup of mixed breeding was given, interperitoneally, 2 ml. of whole citrated blood from the infected bitch. The blood was given 6 days following splenectomy. *Babesia canis* was observed in the blood of the test pup 6 days following injection—12 days after splenectomy The organisms were morphologically similar to those observed in the infected hounds. Large numbers of organisms were readily demonstrable in the circulating blood of the test pup. In contrast, a diligent search was necessary to demonstrate the organisms in the naturally infected hounds.

In the experimental pup, there were clinical signs similar to those observed in the infected bitch. The pup died 21 days following injection. It had a marked eosinophilic leukocytosis, a condition not observed in the infected bitch.

Comparative studies of the staining method used by the authors and standard short-time staining methods indicate that short-time methods are probably unreliable for demonstration of *Babesia* organisms.

Discussion

Of the 18 hounds in the pack, 3 were 10 years old; 1, 6 years old; 6, 4 years old; and 8, under 2½ years old.

The 6-year-old bitch which died had been in the pack for approximately 2 years and had been under observation and treatment periodically for several months. Concurrently and previously, other hounds from the pack had similar clinical signs and had been under observation and treatment. Clinical signs were generally vague; mild icterus, anemia, congested sclera, ocular discharge, and slight, persistent cough were regularly observed. Body temperatures were remittent and varied from 102 to 104 F. Some deaths occurred. Some of the dying hounds had disturbances of the central nervous system preceding death.

Practitioners have reported a similar disease syndrome in dogs in this area for several years. Although babesiasis was suspected, all attempts to demonstrate the organisms, either by stained blood slide technique or by injection of suspect blood into splenectomized dogs were unsuccessful.

The brown dog tick, *Rhipicephalus sanguineus*, occurs commonly in this area. Ticks were a constant problem in the kennel of hounds and tick specimens removed from the bitch which had died were identified[7] as *Rh. sanguineus*. *Rhipicephalus sanguineus* and *Dermacentor variabilis* have been incriminated as vectors of babesiasis in the United States.[9] One authority states that there is no experimental evidence to indicate that babesiasis is definitely transmitted by *Rh. sanguineus*.[5]

In areas where tick infestations are heavy, dogs carrying *Babesia* organisms could become a serious matter. Possibly, the disease could be spread through an entire kennel of dogs by ticks.

Diagnosis and Discussion

The acute form of the disease offers no particular problem for the observant diagnostician. Icterus, hemoglobinuria, anemia, and an enlarged spleen are characteristic of the disease. In Africa, imported dogs of any age always contract a severe form of the disease which is associated with a heavy parasitism of the blood.[5] One authority states[9] the acute form of the disease probably does not exist in this country.

Clinical signs observed in this pack of hounds might have been confused with chronic leptospirosis, hepatitis, hemobartonellosis, or distemper. Demonstration of the organism in stained blood smears is probably diagnostic. It is extremely difficult to demonstrate parasites in blood smears taken from dogs with chronic infection.

Another diagnostic method is inoculation of young splenectomized dogs.[10] Parasites may be demonstrated in the blood 2 or 3 days following inoculation.

Blood smears from the bitch which died had been sent to a local commercial laboratory for examination; a negative report was obtained. As was previously pointed out, short time staining methods are probably unsuitable for demonstration of *Babesia* organisms.

Treatment and Control

Trypan blue, bis-methosulfate,* and diamidine compounds have been reported effective against canine babesiasis infections.[4,5,10] Supportive treatment** with hematinics and whole blood transfusions are also suggested.[4,5,10]

Dogs treated with trypan blue as well as untreated recovered dogs may remain infected for long periods, and the disease may recur following other bodily stresses.[5]

In 1937, one authority pointed out the danger of possible inadvertent transmission of canine babesiasis by whole blood transfusion.[10] Practitioners should give careful attention to the health status of donor dogs, particularly in areas where the disease is known to exist.

Although the vectors of canine babesiasis are unknown,[9] control of ticks and other blood-sucking external parasites may help in reducing the incidence.

Summary

Babesia canis was demonstrated in a Bluetick Coonhound bitch 6 years old and was assumed to be the etiologic agent responsible for a vague disease syndrome in a pack of hounds in the Phoenix, Ariz., area.

Diagnosis was made from a blood smear stained by Giemsa's technique and confirmed by inoculation of a 6-week-old splenectomized pup with infective blood.

Reports of small animal practitioners and results of this study indicate that canine babesiasis may be widespread in this area.

*Acaprin, Farben, Fabriken, and Beyer, Leverkusen, Germany (not generally available in the United States).

**Treatment with whole blood transfusions, hematinics, and B-complex vitamins have been used with good success in other confirmed cases of canine babesiasis by Dr. Russell since this article was written.

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Oxytocin Intranasal Spray

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A Self-Waterer for Dogs

R. M. Johnson, D.V.M., and A. C. Andersen, V.M.D., Ph.D.

WATERING SYSTEMS used in kennels are often inefficient or unsanitary despite the importance of supplying dogs with fresh, clean water. Such was the condition in this kennel for several years, although many attempts were made to correct it. Since 1951, the School of Veterinary Medicine, University of California, has maintained a colony of 400 purebred Beagles for longevity studies. Environmental studies related to the general welfare of the dog represent one part of the experiment,[1-3] and innovations often not only improve kennel hygiene but reduce the work load involved in caring for large numbers of dogs. This report evaluates a self-waterer* installed and tested since 1959.

Evaluation of Conventional Watering Systems

Conventional systems supply water manually—in pans, dishes, or buckets. Water remains in the utensil until drunk by the animal or replaced by the caretaker. Such a system was used in this kennel for 7 years. Two hundred outdoor pens (377 sq. ft. per pen) were supplied with water by a ¾-inch underground water line. From this line, a riser extended 2 ft. above the pen surface in 1 of every 4 adjacent pens. Connections to the riser with ½-inch pipe provided water through standard hose faucets to 1-gallon buckets in each of the 4 pens. Providing fresh water for the dogs required 2 to 5 minutes per pen, depending on the amount of debris in the bucket. During the summer, the water was often warmer than optimum drinking temperature and the caretakers left the faucets slightly open to keep the water cool.

Puddles that frequently resulted were objectionable from the standpoint of kennel hygiene. In winter, the water occasionally froze; either the caretakers had to break the ice and refill the bucket, or the dog had to wait until the ice thawed. Under these conditions, supplying fresh water was so laborious and time-consuming that automatic watering devices were investigated.

Automatic Watering Devices

Automatic watering devices can be placed in 2 categories: (*a*) open-type and (*b*) closed-type. The open-type, with the water exposed directly to the environment, operates on a weight or float principle. A self-waterer using the weight principle was recently described.[4] The float-type keeps the water at a constant level by a valve built into an aluminum drinking pan. The only major advantage of these devices over conventional waterers is that water is not supplied manually. Easy contamination and temperature change still remain problems.

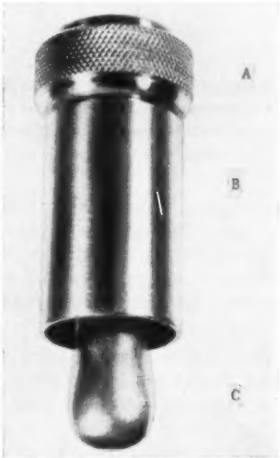

Fig. 1—Self-waterer for dogs: (A) aluminum coupling, (B) body, and (C) wobbler.

From the School of Veterinary Medicine, University of California, Davis. This work was supported by the U.S.A.E.C. Contact AT (11-1) GEN 10.

*K.K. Manufacturing Co., Sunnyvale, Calif.

In a closed-type device, water is supplied to the dogs either in a sanitary container or directly from a water line. Most sealed sanitary containers consist of a glass jar covered with a cone-shaped plastic dispenser containing a ball valve; they operate by gravity flow. Such containers require frequent filling, and the stored water soon attains the temperature of the environment. Also, breakage is a problem.

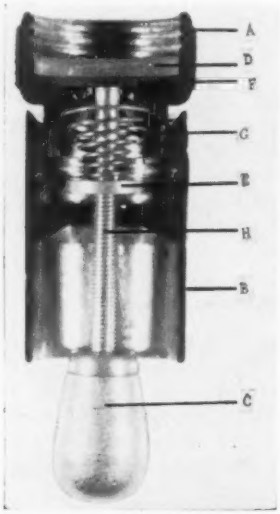

Fig. 2—Assembled self-waterer (longitudinal section). (A) coupling, (B) body, (C) wobbler, (D and F) washers, (E) aluminum washers (baffle), and (G) spring.

The self-waterer that proved satisfactory in our kennel was attached directly to the hose faucets (Fig. 1). Operation of this device depends on the movement (by leverage) of a long screw (H, Fig. 2) attached to a wobbler (C, Fig. 1, 2). The dog licks or nudges the wobbler, which releases water by movement of washers (D and F, Fig. 2). These washers function as a check valve. Water pressure in the line keeps this valve (washer set) closed when the wobbler is not moved. A baffle (E, Fig. 2), maintained in position by a spring (G, Fig. 2), controls the velocity of water flow. The faucet, together with the baffle, allows adjustment to the flow desired. Water pressures between 30 and 60 lb. have not affected the operating efficiency of this device. Since the flow of water through this device is controlled by water pressure, any defects are reflected by leakage. Thus, a defective self-waterer of this type can be readily observed by the caretakers and, of more importance, the dogs are not deprived of water. Over a 2-year period, only 3 of 300 waterers have proved defective; the defect was faulty washers which were readily replaced. Mild freezing temperatures (22 F.) did not affect the devices and, in hot weather (110 F.), the dogs have often been observed allowing water to flow before drinking.

Summary

A conventional method (water buckets) had been used for 8 years to supply over 400 Beagles with water. Since this method was unhygienic and inefficient, an automatic self-waterer was sought. A closed-type was selected on the basis of being fully automatic and sanitary. The device was easily installed, and the dogs quickly learned to drink from it. The device has proved satisfactory over a 2-year period.

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Avian Tubercle Bacillus Infection in the Cat

Jerrold W. Hix, D.V.M.; T. C. Jones, D.V.M.; and Alfred G. Karlson, D.V.M., Ph.D.

TUBERCULOSIS is an infrequent infection in cats in the United States but is more common in regions of the world in which bovine tuberculosis is rampant. Interest in the occurrence of this infection in a cat is intensified by the identification of the avian type of tubercle bacillus. This organism, to our knowledge, has not been clearly incriminated heretofore in feline infections. The purpose of this report is to review the pertinent literature and to report a case of feline tuberculosis.

Review of Literature

Bacteriologic studies have indicated that tuberculosis in cats is usually due to *Mycobacterium bovis;* for this reason, tuberculosis is rarely seen where the disease in cattle is well controlled. In a compilation of data[13] on tuberculosis in cats from the world literature, including 15 cases from France, it was recorded in 1945 that 141 of 147 (96%) were due to bovine tubercle bacilli and that the remainder were of human origin. In 1949, at the University of Liverpool,[8] tuberculosis was found in 13 of 100 cats at necropsy; in 6 cats, which were studied bacteriologically, tubercle bacilli of bovine origin were found. The author believed that the high incidence of tuberculosis in his series of cats was due to the prevalence of bovine tuberculosis in the surrounding area.

In Switzerland, several surveys have indicated that, as in Scotland, the predominant cause of tuberculosis in cats is the bovine tubercle bacillus. In 1954, it was recorded[12] that, in Zurich during a 6-year period ending in October, 1954, there were 80 cases of tuberculosis (6.3%) among 1,278 cats examined. In 29 cases, the bacilli were typed and each was found to be a bovine strain. It is of particular interest that, in the entire series, there were 31 Siamese cats of which 15 had tuberculosis. In this report, it was concluded that Siamese cats may have a special susceptibility to tuberculosis. In Bern during a 4-year period prior to September, 1954, it was found that, of 590 cats necropsied, 47 (7.9%) were tuberculous; bacilli from only 19 cats were subjected to typing procedures and, of these, 18 were identified as bovine and one was listed as a possible avian tubercle bacillus.[5]

The role of cats as possible disseminators of tuberculosis has not been explored but, in this regard, a 1958 report from Germany[1] is of interest. Tuberculosis in a herd of cattle, previously free of the disease, was ascribed to 2 cats, both of which were found to be infected with bovine tubercle bacilli. In a similar report in 1957, evidence was presented which indicated that a cat with bovine tuberculosis transmitted the infection to cattle.[11] A report from Scotland in 1957 described a study on the relationship of tuberculosis in man, cats, and dogs.[7] As part of this study, 15 cats, owned by patients whose sputum contained tubercle bacilli, were examined by rectal swab and human-type tubercle bacilli were found in 2. These 2 cats were apparently normal and no evidence of tuberculous infection was found at necropsy. It was suggested that the human-type tubercle bacilli were merely in transit in the intestinal tract. By such means, cats could be vectors. In this study, it was pointed out that tuberculosis in cats is rare in West Scotland due to the eradication of bovine tuberculosis.

Experimental work has revealed that cats have a greater susceptibility to bovine than to human type of tubercle bacilli. In studies recorded in 2 reports,[3,2] it was found that it was possible to produce tuberculosis in 8 of 10 cats if they inhaled bovine tubercle bacilli. On the other hand, using large doses of human tubercle bacilli, it was possible to produce lesions in only 4 of 14 cats. An extensive study was made in Japan[10] using about 200 cats. The cats were allotted to various groups and infected either intravenously or subcutaneously with doses of 0.5, 1.0, 3.0, or 5.0 mg. of human or of bovine tubercle bacilli. Some cats in each of the groups were killed and examined in 1 or 3 months. No tuberculous lesion was found in any cat given human tubercle bacilli, but infection was produced in one month by even the smallest dose of bovine tubercle bacilli. Of additional interest in this study was the observation that none of the cats became sensitive to tuberculin even at doses of 0.1 ml. of Old Tuberculin in 1:10 dilution.

Observations on experimental infection with avian tubercle bacilli in cats are too limited to permit any conclusions, but some data are worthy of mention. In one such study,[6] 3 cats were inoculated intravenously and 3 others subcutaneously with avian strains using amounts ranging from 0.1 to 100 mg. of organisms. Most of the cats died or were killed in poor

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health within several months. No histopathologic studies were made. Two kittens infected intravenously died in 16 days and smears of various organs contained many acid-fast bacilli. Two cats which were given organisms intraperitoneally died on postinoculation days 62 and 69, respectively. In the cat which lived longest, no bacilli could be found in smears of the liver, spleen, or kidneys. However, the cat which died on day 62 was examined histopathologically, and it was found that sections of a lung, liver, spleen, omentum, and a lymph node were "swarming with bacilli which have a marked predilection for intracellular growth with very little tissue destruction."[6]

Case Report

A spayed female Siamese cat 4 years old was brought to Angell Memorial Animal Hospital on March 3, 1959, with the following history: According to the owner, the cat had been weak and frail throughout its life and its coat was always rough. Three or 4 episodes of unexplained anorexia, "shivering," and weight loss were observed during the previous 2 years of the cat's life. These episodes lasted about 2 weeks with apparent recovery following.

During one of these periods of illness, on April 9, 1958, the cat was admitted to Angell Memorial Animal Hospital, with a history of vomiting and diarrhea for 3 days. Upon admission, rectal temperature was 102.6 F.; the cat was dehydrated, and its appetite was poor. Total WBC was 28,500/cmm.; urine specific gravity, 1.057; albumin, sugar, and indican, negative; and color, yellow and cloudy. A diagnosis of gastroenteritis of unknown cause was made. After 7 days in the hospital, the cat improved and was sent home. However, 4 days later, it was returned with recurrence of the signs. At this time, the temperature was 102 F. Total WBC was 18,000/cmm.; neutrophils comprised 67% (filamented cells 1, segmented cells 42, band cells 18, myelocytes 1, and metamyelocytes 5); eosinophils, 1%; and lymphocytes, 32% of the blood. A series of radiographs, with barium, of the gastrointestinal tract disclosed no significant deviation from normal. The cat made a good recovery and remained apparently well until the final episode of illness.

At the time of final admission on March 3, 1959, the cat had been coughing for several months and periods of rapid and difficult breathing were observed by the owner. Progressive weight loss was observed during the previous 2 months. The appetite was poor during the latter month and progressed to complete anorexia, followed, in the last 2 weeks, by weakness and lethargy. Upon admission to the hospital, the cat was emaciated and dehydrated. The mucous membranes were pale and cloudy in appearance. Mild dyspnea was evident and the rectal temperature was 102.8 F. Abdominal palpation revealed nothing significant.

A tentative diagnosis of anemia was made, and treatment was started using an oral hematopoietic,* folic acid, B complex vitamins *per os*, and 5% dextrose containing a protein hydrolysate** by subcutaneous injection. On the 2nd hospital day (March 4), its appetite was fair, and its general condition unchanged. Hemoglobin was 9.5 Gm./100 cc. of blood; packed cell volume, 22%; neutrophils, 80% (segmented cells, 54%; filamented cells, 20%; band cells, 6%); and lymphocytes, 20%. The red blood cells contained bodies identified as *Hemobartonella felis*, and there was marked rouleau formation. Oxytetracycline,† 100 mg., was given by mouth every 8 hours.

On the 3rd hospital day, the cat's condition remained the same but, on the 4th day, its temperature rose to 103.4 F. The cat did not eat, vomited occasionally, and breathed with more difficulty. The following day, the cat's condition deteriorated rapidly and the dyspnea became severe. A lateral radiograph of the chest revealed severe diffuse congestion of the lungs and calcification of the retropharyngeal and axillary lymph nodes (Fig. 1). The cat died while a blood transfusion was being given.

The cat had been born in a cattery in April, 1954, and was moved when 2 days old to a farm in Pennsylvania where it remained for 2½ months. For 4 months, the cat was in a cattery in Pennsylvania, then it was brought to Boston and remained with the present owner until admitted to the hospital.

In the same household, there was another spayed female Siamese cat and a male Standard Poodle. The cat was born in England in 1953 and was brought to the farm in Pennsylvania in the spring of 1954.

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*Perihemin, Lederle Laboratories, Pearl River, N.Y.
**Parenamine, Winthrop Laboratories, New York, N.Y.
†Terramycin, Pfizer Laboratories, Brooklyn, N.Y.

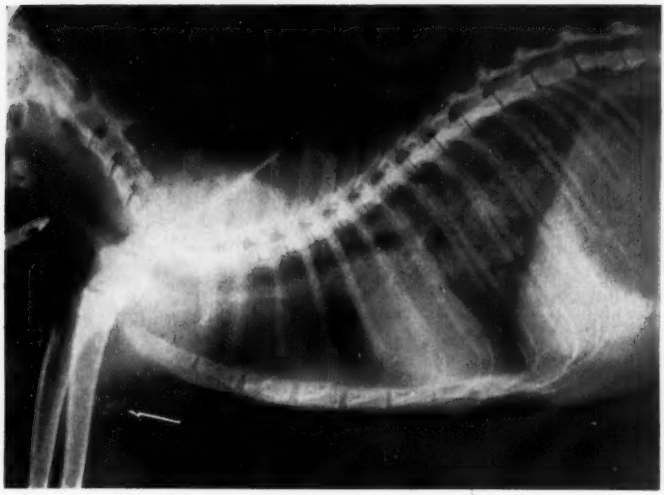

Fig. 1—Lateral recumbent radiograph of tuberculous cat. There is radiopaque material in the axillary lymph nodes (arrow) and diffuse opacities in the lung.

It lived with the affected cat on the farm and both were brought to Boston at the same time. The Poodle had been in the same household for several years. On examination, there was no sign of illness, and tuberculin tests as well as radiographs of the chests of the normal cat and the Poodle were negative. This normal cat remained well until killed by an automobile on Aug. 24, 1959; a necropsy was not performed.

Medical Data on the Family.—The owner of the affected cat was told that it had tuberculosis and was advised to contact her physician. Each member of the family was examined by the physician who advised us that none had evidence of tuberculosis.

Necropsy Findings.—At necropsy the body of the cat weighed 2.18 kg., it was moderately emaciated, and only a small amount of yellowish, subcutaneous fat was present. Each of the body lymph nodes was greatly enlarged and, on cut section, there were irregularly shaped, yellowish areas involving the medulla and extending into the cortex of the node. The retropharyngeal lymph nodes were particularly large and prominent, measuring 3.0 by 2.0 by 1.5 cm. in maximum dimensions. The left retropharyngeal node was more resistant to cutting than other nodes and had a slightly gritty consistency. The dimensions of the axillary, inguinal, mandibular, and prescapular nodes indicated enlargement from 1 to 5 times their normal size. The axillary nodes also had a gritty consistency.

Gross lesions were not present in the nares, larynx, or trachea. In the lower respiratory system, the bronchi contained a moderate amount of thick, tenacious, yellow fluid. The lungs were rather uniformly heavy, grayish pink. On cut section, there was a fleshy appearance with much loss of normal spongy texture. Approximately 20 cc. of pink-tinged fluid occupied the pleural cavities. The tracheobronchial and mediastinal lymph nodes were enlarged and similar in gross appearance to the nodes of the body.

No lesion was seen grossly during a careful examination of the rest of the body. The visceral lymph nodes in the abdominal and pelvic cavities were grossly normal.

On microscopic examination, the medulla of the lymph nodes was found to be almost completely replaced by a broad zone of caseous necrotic debris in which a few capillaries and scattered lymphocytes made up the only recognizably viable cells. The rest was rather amorphous, eosinophilic material. Surrounding this was a band of epithelioid granulation tissue with a few lymphocytes scattered among the epithelioid cells. In a few areas, the necrotic material extended to the old capsule of the node, but in most sections the epithelioid tissue replaced the cortex and enclosed the caseous material. A few microscopic-sized tubercles were also evident in

the cortex of the node, with a central zone of caseation surrounded by epithelioid cells. Langhans-type giant cells were not found.

The pulmonary consolidation was due to replacement of alveoli by epithelioid cells similar to those seen in the lymph nodes. However, caseous necrosis was not a feature of the lesions in the lung. Only a few intact alveoli were evident in the sections of lung, most of them being displaced or encroached upon by the epithelioid granulation tissue (Fig. 2). Lymphocytes were scattered among the epithelioid cells but giant cells were not observed (Fig. 3).

Sections stained by the Ziehl-Nielsen method contained myriads of acid-fast, rod-shaped bacilli in the lymph nodes and lungs. These bacilli were particularly numerous in the epithelioid cells, and many of the cells had their cytoplasm distended with organisms. Some organisms were also recognizable in areas of necrosis in the lymph nodes. Replicate sections were also stained with the periodic acid-Schiff method (PAS) which did not disclose any fungi or other organisms.

Blocks of tissue were collected aseptically from the axillary lymph nodes and lungs and then kept at −20 C. in a deep-freeze chest pending histologic study of fixed specimens from all organs. After demonstration of the lesions and the acid-fast bacilli in them, some of the frozen material was packed in sterile borax and mailed to the Mayo Foundation, Rochester, Minn., for identification of the organisms.

Procedure for Isolation and Identification of the Microorganism

The portion of lymph node and lung tissue collected at necropsy, about 1 cm. in diameter, was put into boiling water for a few seconds to remove the borax in which it had been packed. It was ground into a pulpy mass in a sterile mortar and then suspended in 10 ml. of sterile water. Smears of this material contained many acid-fast bacilli. Two guinea pigs and 2 rabbits were each inoculated intraperitoneally with 0.5 ml. of the tissue suspension. Approximately 0.1 ml. of the tissue suspension was transferred to each of 6 tubes of Sabouraud's dextrose agar for the detection of *Nocardia* and fungi. After 6 weeks of incubation at 30 C.. there was no growth. Two ml. of the tissue suspension was mixed with 2 ml. of 4% NaOH solution; this was placed in a shaking machine for 20 minutes, neutralized with 6% HCl, centrifuged, and transferred to 4 tubes of Lowenstein-Jensen medium. In 3 weeks, there were innumerable pinpoint colonies of acid-fast bacteria which, in 2 more weeks, formed a smooth, rounded, moist growth. The growth was suspended in sterile water to form a uniformly turbid suspension. This was adjusted to the density of tube No. 0.5 of McFarland's nephelometer and used for the inoculation of 2 guinea pigs intraperitoneally and 2 rabbits and 2 chickens intravenously. The chickens were known to be from a tuberculosis-free flock and were negative to the intradermal sensitivity test using avian tuberculin.

Results of Animal Pathogenicity and Tuberculin Sensitivity Tests.—The 2 guinea pigs given the tissue suspension appeared abnormal for about 2 weeks after inoculation as indicated by rough coat, inactivity, and decreased food intake, but they recovered and remained healthly for the remainder of 90 days of observation. Sixty days after inoculation, simultaneous sensitivity tests were performed on these 2 guinea pigs using avian and mammalian Old Tuberculin. In these and all succeeding tests, 0.1 ml. of 1:100 dilution was used. In one guinea pig, a reaction 10 mm. in diameter appeared at the skin site where mammalian tuberculin was injected, in contrast to a 22 mm. reaction at the site where avian tuberculin was injected. The other guinea pig failed to react to mammalian tuberculin but had a 25 mm. reaction with necrosis to avian tuberculin. Both guinea pigs were killed 90 days after inoculation. At necropsy, the only visible lesion was a caseous nodule in the omentum of one guinea pig. Smears of this nodule contained acid-fast bacilli. It was cultured on Lowenstein-Jensen medium on which smooth, rounded colonies resembling those of avian tubercle bacilli appeared in 5 weeks.

Two rabbits inoculated with the tissue suspension became visibly ill in about 4 weeks. When tested with avian and mammalian tuberculin 60 days after inoculation, neither rabbit reacted to either tuberculin. Both rabbits were moribund in 72 days at which time they were killed. One had an enlarged, infarcted spleen and an enlarged

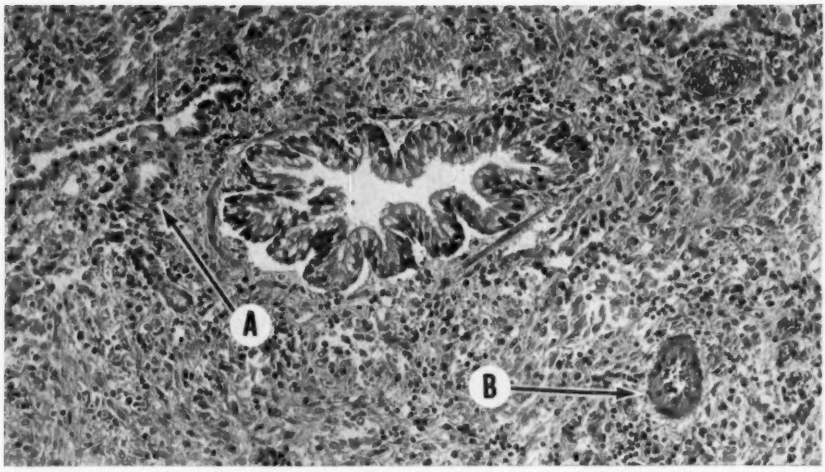

Fig. 2—Section of lung illustrating the obliteration of alveoli by epithelioid cells and scattered lymphocytes. There is a bronchiole in the center and remnants of alveolar ducts (A) and arteries (B). H & E stain; x 200.

liver. There were multiple miliary lesions and adhesions of the serous surfaces of the intestines and the kidneys. The 2nd rabbit had an enlarged spleen and some patches of bronchopneumonia. Smears of the spleens of both rabbits contained innumerable acid-fast bacilli.

Of the animals inoculated with a pure culture from the original tissue, the 2 rabbits died on postinoculation days 17 and

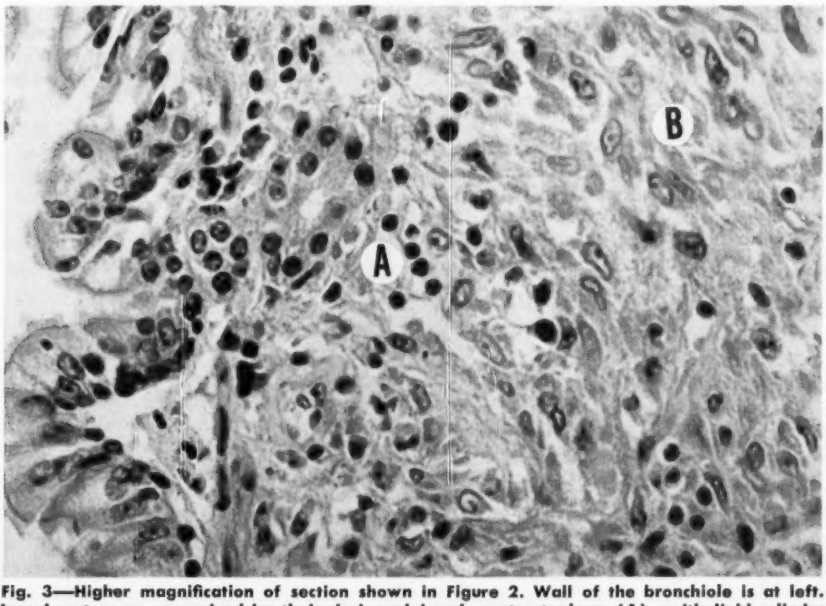

Fig. 3—Higher magnification of section shown in Figure 2. Wall of the bronchiole is at left. Lymphocytes are recognized by their dark nuclei and scant cytoplasm (A), epithelioid cells by their vesicular nuclei and abundant, ill-defined cytoplasm (B). Giant cells, caseous necrosis, and calcification are absent. H & E stain; x 780.

23, respectively, both with greatly enlarged spleens and livers and extensive consolidation of the lungs. Smears of the spleens contained many acid-fast bacilli.

Two chickens were tested with avian and with mammalian tuberculin in 21 days. One chicken was visibly ill at this time and failed to react to either tuberculin. This chicken died 5 days later (postinoculation day 26) and was found to have a greatly enlarged spleen and enlargement of the liver and kidney. Smears of the spleen disclosed many acid-fast bacilli. The 2nd chicken reacted positively to avian tuberculin and negatively to mammalian tuberculin in 21 days. This same chicken was tested again on postinoculation day 60 and the reaction was positive for avian and questionable for mammalian tuberculin. On day 69, the chicken was losing its appetite and was obviously ill. At necropsy, there were many miliary tubercles in the enlarged liver and in the spleen. Many acid-fast bacilli were seen in smears of the spleen.

The guinea pigs which had been inoculated with the culture appeared to be normal and healthy. When tested in 21 days, both had reactions of about 10 mm. to avian tuberculin and one had a similar reaction to mammalian tuberculin. They were tested again in 68 days, using 3 different avian tuberculins and mammalian tuberculin. At this time, in the 1st guinea pig, a reaction of 10 mm. was recorded for the mammalian and 12, 16, and 23 mm. reactions were recorded for the 3 avian tuberculins, respectively. The 2nd guinea pig was negative to mammalian tuberculin but reactions were recorded as 18, 18, and 24 mm. to the avian tuberculins. These guinea pigs were killed on postinoculation day 95. One had a 2 mm. abscess at the site of inoculation, smears of which disclosed acid-fast bacilli. Gross lesions were not seen in the other guinea pig.

Results of Culture Studies.—The colonies on the Lowenstein-Jensen medium were typical of avian tubercle bacilli at 5 weeks. They were smooth, entire, rounded, and moist and were readily suspended in water. Cultures in Proskauer and Beck liquid medium formed a turbid growth with no pellicle. No cords were formed in this liquid medium and a test for niacin in the medium was negative after 3 weeks. Subcultures of the original isolations were found to be resistant to 10 μg. of streptomycin, to more than 10 μg. of isoniazid, and to more than 10 μg. of *p*-aminosalicylic acid per milliliter of egg yolk agar. After exposure to light, for about 6 weeks, the subcultures became buff-colored. The aforementioned cultural features are characteristic of avian tubercle bacilli.

A tuberculin was prepared from the growth on the original tubes by filtering a veal-infusion broth culture and reducing it to 10% of the original volume but without adding phenol. This was diluted 1:1,000 in water and 0.1 ml. was used for intradermal injections into 2 guinea pigs which had been infected with bovine tubercle bacilli. Similar tests were performed on 4 guinea pigs which were infected with human tubercle bacilli. In these guinea pigs, cutaneous reactions of 4 to 10 mm. in diameter were recorded. Three pairs of guinea pigs were infected by inoculation with a different strain of avian tubercle bacilli. Tests with this tuberculin prepared from our culture resulted in skin reactions up to 24 mm. in diameter.

Plate agglutination tests, using a heavy antigen,[13] were performed with serum samples from normal and known tuberculous chickens. The antigen was prepared from the first subcultures of the original isolates. In addition, similar tests were carried out with serum samples from normal guinea pigs and from guinea pigs that had been sensitized to avian tubercle bacilli. Serum from the 5 normal chicken did not cause agglutination of the antigen, but 8 of 11 serum samples from tuberculous chickens did. Similarly, agglutination was not caused by serum samples of normal guinea pigs, but serum samples from 5 of 7 guinea pigs, each inoculated with a different strain of avian tubercle bacillus, did cause agglutination.

Summary

Feline tuberculosis has been reported in the literature more frequently in regions in which bovine tuberculosis was prevalent and, in most instances, the organisms infecting cats were the bovine type. There is some evidence that Siamese cats may be particularly susceptible to tuberculosis. One report was found in which avian-type tubercle bacilli were suspected, but not proved, to be the cause of infection in a cat.

A spayed female Siamese cat 4 years old progressively lost weight, coughed persistently, and was intermittently dyspneic over a period of 4 months. It was brought for veterinary care in a weak and lethargic condition and was found to have anemia associated with the presence of *Hemobartonella felis* in the erythrocytes. Radiographs revealed enlarged and calcified axillary and retropharyngeal lymph nodes and diffuse consolidation of the lungs. The cat died on the 3rd day in the hospital. At necropsy, enlarged and calcified retropharyngeal and axillary lymph nodes were found to have been largely replaced by necrotic areas surrounded by a zone of granulation tissue. The consolidated lungs were largely filled by epithelioid cells relatively free of necrosis and without Langhans-type giant cells. Large numbers of acid-fast bacilli were demonstrated in tissue sections. These organisms were recovered in cultures and demonstrated by cultural characteristics, infection of animals, tuberculin tests, and agglutination tests to be *Mycobacterium avium*.

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Drugs for Urinary Tract Infections

Resistant staphylococcic infections of the urinary tract of man are rare, but when encountered they may respond to ristocetin, vancomycin, or carbomycin. Parenteral kanamycin will control many staphylococcic infections. Polymyxin B is most potent against *Pseudomonas aeruginosa* but because of its toxicity can be used parenterally only in extreme cases. For long term therapy in chronic and recurrent cases, sulfonamides, nitrofurantoin, or methenamine can be given safely over extended periods at reduced dosages. Antibiotics given over long periods may be dangerous.—*Med. Abstr. Serv., Series 192, No. 13, Feb., 1961.*

Avian Spirochetosis (*Borrelia anserina*) Epizootics in Arizona Poultry

Ned W. Rokey, D.V.M., and V. N. Snell, M.T.

AVIAN SPIROCHETOSIS, previously unreported in Arizona, was diagnosed in 5 flocks of chickens. Mortality ranged from 0 to 40%. A bacterium, *Borrelia anserina*, was assumed to be the etiologic agent. It was identified principally on the basis of morphologic characteristics.[1-4]

Diagnoses were made by darkfield microscopy and stained blood slides; they were confirmed by inoculation of susceptible test birds.

History

Avian spirochetosis caused by *B. anserina* is enzootic in many parts of the world and has been held responsible for heavy losses of domestic poultry.[1,3] Mortality of 60% has been reported.[12]

The 1st confirmed *B. anserina* epizootic in the United States was probably in California turkeys in 1945.[5,6,8] Another epizootic in 1947 also occurred in California turkeys.[8] In 1955, a spirochete infection was reported in pheasants in California and was assumed to be different from that reported in turkeys.[9] In the United States, information regarding *B. anserina* infections in chickens is vague,[12] although such reports may exist, no confirmed reports could be found in the literature.

Case Reports

Flock 1, Nov. 8, 1958.—This was a breeding flock composed of 750 Leghorn hens and cockerels. There were approximately 10,000 other chickens on this ranch. This flock was housed in one end of a 2-unit building. A similar number of birds of the same breed occupied the other unit. The building was of frame construction. Outside walls were covered with 1-inch, mesh wire screen. A feed room separated the 2 units. Floors were of concrete covered with straw litter.

Cyanosis, dehydration, and listlessness were the 1st clinical signs observed and appeared initially in cockerels in one flock. The condition subsequently spread throughout the entire flock affecting both hens and cockerels. Mortality was approximately 40% in the affected flock. There was no clinical evidence of the disease in the flock in the other unit of the house.

The owner reported that in previous years a similar condition had existed in birds housed in this same unit. Unconfirmed diagnosis of fowl cholera had been made on these occasions. Treatment with sulfonamides seemed to have little apparent effect on the course of the disease.

On examination of the premises, neither fowl ticks, *Argas persicus*, nor fowl mites, *Dermanyssus gallinae*, were found. However, when questioned regarding the possibility of *A. persicus* infestation, the owner did admit that ticks had been a problem on the ranch from time to time, particularly in the unit where the sick birds were housed.

Flock 2, April 8, 1959.—This flock was composed of 300 mature Leghorn hens. Approximately 3,000 birds were kept on the ranch. The birds were confined in one unit of a 4-unit house. Partitions were of 1-inch wire screen. Dirt floors were covered with straw litter.

The owner gave the following history. In July, 1958, 3,000 chicks were started in this building, approximately 750 per unit. When about 12 weeks old, the birds in 2 adjacent units at one end of the house became sick. The birds were anemic and had pale combs. Of the original 1,500, 1,100 had died by the time birds reached full productivity at approximately 6 months of age. Birds in the other 2 units remained normal.

In March, 1959, the remaining 400 birds were concentrated in the end unit of the house. Three hundred birds from the other 2 units were placed in the vacated unit and became sick approximately one week later. An unconfirmed diagnosis of fowl cholera was made by a poultry serviceman. Losses continued for approximately a week before a diagnosis of avian spirochetosis was made by personnel of this laboratory. Mortality was approximately 17%.

From the Animal Pathology Laboratory, University of Arizona Experimental Farm, Mesa, where Dr. Rokey is associate pathologist in charge of the laboratory and Mr. Snell is research associate.

Arizona Agricultural Experiment Station technical paper No. 631.

The authors thank William R. Hinshaw, D.V.M., U.S. Army Biological Warfare Laboratories, Fort Detrick, Frederick, Md., for assistance in identification.

No signs of this disease were seen in other birds in the building.

Control of fowl ticks was a constant problem on this ranch. A few adult ticks were found when the premises were searched. Seed ticks were found on infected birds.

Flock 3, May 4, 1959.—This was a backyard flock of approximately 80 birds consisting of 20 mature, heavy breed, laying hens, 40 Leghorn pullets 12 weeks old, and 20 Leghorn pullets 8 weeks old. The 40 birds 12 weeks old had been purchased 2 weeks earlier from the ranch which had flock 1. Only young birds in the flock were affected. Mortality in this flock was insignificant. Spirochetes were found only in the 12-week-old birds. Ticks were not found on the premises.

Flock 4, May 22, 1959.—This flock consisted of 275 Leghorn pullets 16 weeks old. Mortality was about 7%. The owner stated that a similar disease condition had never been previously encountered on the farm. The only other birds on the ranch were 300 mature Leghorn hens which were not involved.

A diagnosis of range paralysis had been made by a local poultry serviceman prior to the diagnosis of spirochetosis at this laboratory. Ticks were found on this farm.

Flock 5, May 25, 1959.—This epizootic in flock 5 was confined to 175 laying hens of mixed breed housed separately from 150 other laying hens. The 2 houses were approximately 20 ft. apart.

Mortality was approximately 18% in the infected group, whereas losses in the noninfected group remained essentially normal. The owner stated that mortality during brooding was insignificant in both groups.

On examination of the premises, a heavy concentration of *A. persicus* ticks were found in both houses. The owner reported that a similar disease had occurred in a flock of 200 laying hens during the previous year and that nearly the entire flock had died. The previous losses occurred in the same building in which the present epizootic occurred.

Clinical Signs

Depression, weakness, and severe cyanosis of the combs and wattles were clinical signs observed in mature birds. In early stages of the disease, combs and wattles were a bright, waxy red. Body temperatures varied from 110 to 112 F. In terminal stages of the disease, extreme cyanosis of the combs, wattles, and membranes were regularly observed with normal or subnormal temperatures. Emaciation and dehydration were rapid and marked. Fecal material was scanty, watery, and green, with large amounts of urates. Occasionally, fecal material was light brown.

In younger birds, clinical signs were vague. Depression was not a significant finding, although some leg and wing weakness was noticed. This was manifested in some birds by drooping of one or both wings and a tendency to sit down. Rather than cyanosis, as observed in older birds, paleness of the combs and wattles was seen regularly. Feces were green stained in some birds, but this was an inconsistent finding.

Methods

Standard methods of necropsy were followed. Blood smears were examined by both darkfield and brightfield microscopy. Blood smears were stained by Giemsa's method. Histologic sections were stained with hematoxylin-eosin and by Giemsa's method. Histologic sections were stained prepared at this laboratory were used for bacteriologic study. Inoculation of test birds was made with aseptic technique. Infective whole blood was obtained by aseptic cardiac puncture of naturally infected birds. Serial passages were conducted by the same methods.

Results

Necropsy Findings.—In adult birds, there was a distinct hyperplasia and mottling of the spleen. The mottling seemed to be characteristic of the disease. Spleens were enlarged up to approximately 6 times normal size. In some instances, necrotic areas were present. The lesions observed in the liver were variable. Apparently, when large numbers of spirochetes were in the circulating blood, livers were enlarged, dark, and friable with occasional subcapsular hemorrhage. However, when spirochetes were clumped in the blood, or had evidently disappeared from the blood, necrotic areas in the liver were observed. These areas were white and varied in size from pinpoint to 1 or 2 mm. in diameter.

Other necropsy findings were variable. Some birds had petechial hemorrhages on the serosal surface of the intestinal tract, pericardium, abdominal fat, and subcutaneous tissues. Intestinal tracts had various degrees of enteritis. Free blood was never observed. Intestinal contents were stained dark green, and only a small amount of fecal material was present. Crops were consistently devoid of food but usually

filled with water. Ruptured egg yolks were regularly observed in laying hens.

Kidney damage varied. In some cases, necrotic areas were observed but were not distinctly different from the usual appearance of kidneys from chickens in this area.

Young birds had fewer lesions than adult birds. Usually, the spleens were enlarged. This enlargement was not of the magnitude observed in older birds, nor was the characteristic mottling apparent. Other lesions were inconsistent and not characteristic. Enteritis was not a constant feature. In contrast to older birds, young birds consistently had thin, watery blood.

Hematology.—Examination of stained blood slides revealed purple-staining spirochetes. These varied, apparently depending upon the stage of infection. In the initial stage of infection, 1 to 4 spirochetes were observed per oil-immersion field. In some instances, as infection progressed, numbers of spirochetes increased to as many as 200 to 300 per field. In terminal stages, as organisms clumped and were in concentrations that made it impossible to determine the numbers present. A constant finding observed in stained blood slides was polychromatic red blood cells. Approximately 10% of the red blood cells were involved in some birds, especially in young birds.

Under darkfield microscopy, motility was distinctly rotary and linear in direction. The spirochetes measured from 8.6 to 18.2 μ with an average length of 12 μ. In early stages of the disease, the spirochetes appeared to be longer. Number of spirals varied from 5 to 10 with an average of 8 spirals. The spirals were loosely coiled.

Bacteriology.—All attempts to propagate the organisms in artificial mediums were unsuccessful. No pathogenic bacteria were demonstrated on cultural study of selected tissues of infected birds.

Histopathology.—In the kidneys, collecting tubules had undergone coagulation necrosis. Capillaries were engorged. Hemorrhagic infarcts in various stages of resolution were encountered. Lymphocytic infiltration of interstitial tissue was a common finding.

In the liver, there were subcapsular hemorrhages. Multiple areas of focal necrosis and a cellular infiltration of the hepatic triads were seen. The cellular infiltration consisted of lymphocytes and large phagocytic cells. The venous system had a characteristic lymphocytic proliferation zone. The large bile ducts were surrounded by a wide zone of lymphocytic proliferation. Fatty degeneration of varying degrees were observed.

Large areas of hemorrhage were prominent in the spleen, and necrosis was observed in centers of reticular cell groups. The general splenic structure was intact, but an active proliferation of lymphocytic elements gave the splenic structure an abnormal appearance.

Localized nests of lymphoid cells were seen between the cardiac muscle fibers. There was little apparent damage to the cardiac muscle.

Congestion, hyperemia, and pneumonic areas were observed in the lungs. In some of these areas, lymphocytic infiltration completely obliterated the normal lung structure.

Experimental Findings

Four mature chickens, 2 males (No. 1 and 2) and 2 females, (No. 3 and 4) were given 1 ml. of whole blood intravenously which was obtained from an affected bird. By darkfield examination, spirochetes were demonstrable in the circulating blood within 24 hours; at 48 hours, examination revealed approximately 200 spirochetes per high dryfield. At 72 hours, the organisms had completely disappeared from the blood of bird 1, whereas large clumps of spirochetes were in the blood of bird 2. Bird 1 died during the day. The blood of bird 2 was negative of spirochetes at 96 hours, and it died during that day.

Forty-eight hours following inoculation of the 2 male birds, 1 ml. of blood was removed from bird 2 and injected into the wing veins of 2 additional male birds. Results of the 2nd serial passage were essentially those of the initial passage; however, spirochetes had disappeared from the blood at 72 hours. One of the birds from the 2nd serial passage died in 4 days; the other, 5 days following inoculation.

When the 2 females, birds 3 and 4, were inoculated, spirochetemia was demonstrated within 24 hours and reached a peak at 48 hours. All evidence of spirochetemia had disappeared at 72 hours. One of the birds died 96 hours following inoculation,

whereas the 2nd bird became moribund but finally recovered.

Clinical signs and necropsy lesions in the experimental birds were indistinguishable from those observed in the naturally infected mature birds.

Inoculation of chicks 2 weeks old with 0.1 ml. of infective blood resulted in a spirochetemia in 24 hours. The organism could not be demonstrated by darkfield microscopy or stained-slide technique after 96 hours. Mortality was less than 10% in challenged chicks. Necropsy lesions of chicks were limited to splenic enlargement. Other findings were insignificant. A pronounced paleness of combs and mucous membranes as well as leg and wing weakness were observed in some of the challenged chicks.

Results of inoculation of experimental birds from the 4 other epizootics were similar.

Bacteriologic examination of tissue from experimentally infected birds was negative for pathogenic bacteria including *Pasteurella multocida*.

Discussion

A bacterium identified as a spirochete was assumed to be the etiologic agent responsible for natural epizootics of avian spirochetosis. This bacterium compares closely with the morphologic description of *B. anserina*.[1] The spirochete could be demonstrated regularly in the blood of experimental birds. Sexually mature chickens were highly susceptible. Younger birds were also susceptible, but to a lesser degree.

Pigeons and doves developed a spirochetemia when inoculated with infective blood, but were asymptomatic. Rabbits and a sheep were completely refractory to challenge.

Clinical signs and necropsy lesions in experimental chickens were similar to those observed in naturally infected birds. All attempts to culture the spirochete in artificial mediums were unsuccessful.

Morphologic characteristics, species susceptibility, and cultural results indicate that the organism was probably *B. anserina*. The spirochete was similar to but appeared to be shorter than the organism in the California turkey epizootics.[4]

Mode of Infection.—Ticks (*A. persicus*), mites (*D. gallinae*), and *Culex* mosquitoes have been reported as vectors of *B. anserina*.[2,3,10] Ticks and mites were not associated with the epizootics reported in California turkeys.[8] Ingestion of contaminated feces,[7] cannibalism,[8] and cohabitation[13] have also been reported as contributing factors. Visceral gout, inbreeding, and obesity are reported as predisposing causes infection.[13]

Argas persicus ticks were associated with 4 of the 5 epizootics studied by the authors. Without exception, all infected flocks were in ground-type housing.

It may be significant that spirochetosis reappeared on the ranch cited in flock 1 when 250 Leghorn breeding cockerels were housed in the same unit in which the initial epizootic occurred. The house had been thoroughly cleaned, disinfected, an acceptable parasiticide had been applied, and the house had been vacant for approximately 60 days. This epizootic was diagnosed April 28, 1959, approximately 6 months after the initial infection. Mortality was approximately 27%.

The infection also reappeared in flock 2 approximately 6 weeks after the initial infection. This epizootic occurred in the remaining birds of the previously infected unit.

It is interesting, and may be significant that, in flock 3, the group of 40 Leghorn pullets 12 weeks old had been purchased when 2 weeks old from the ranch that had flock 1. The group of 275 pullets 16 weeks old in flock 5 was also purchased from that ranch when 2 weeks old.

Treatment

Penicillin has been reported to be effective in the treatment of *B. anserina* infections.[8] Flock 5 was treated with penicillin with apparently good results. The dose was 90,000 units of procaine penicillin G in oil, administered intramuscularly. Flock 3 was also treated with penicillin with a marked drop in mortality; however, the disease reappeared in approximately 6 weeks. In the group of 250 Leghorn cockerels from flock 1, there was little response to treatment with 15,000 units of penicillin. Treatment was repeated in 72 hours with 90,000 units of penicillin. Recovery was apparently rapid.

Treatment of laying hens may be open to question. Infected birds were regularly

observed to have ruptured yolk sacs, a condition which could probably make the birds unprofitable for retention in the flock.

Diagnosis

Diagnosis of avian spirochetosis is difficult. It is dependent upon demonstration of the organism in affected birds and should be confirmed by inoculation of experimental birds. Diagnosis by necropsy lesions and negative bacteriologic findings is questionable. Spirochetosis could possibly be confused with other avian diseases, particularly fowl cholera and fowl typhoid. In adult birds, the clinical signs, necropsy lesions, and flock mortality of spirochetosis are similar, if not identical, to those observed in acute epizootics of fowl cholera. Insofar as fowl typhoid is concerned, blood serum samples from some infected birds agglutinate paratyphoid antigens. Fowl cholera and fowl typhoid were diagnosed in 2 of the mature flocks. In another flock of younger birds, the diagnosis was range paralysis. The diagnoses were made by poultry servicemen.

Flock history, clinical signs, necropsy lesions, and the presence of arthropod vectors may be helpful to the diagnostician.

Diagnosis of avian disease by clinical signs and necropsy lesions without proper laboratory examinations is a questionable procedure and, in the case of *B. anserina*, potentially dangerous. The importance of adequate laboratory diagnosis is evident, not only from the standpoint of economics to the owner, but also from the more important aspect of potential danger to the poultry industry should a disease of this nature go undetected and become enzootic in the poultry flocks of this country.

Summary

A spirochete, tentatively identified as *Borrelia anserina*, was presumed to be the etiologic agent responsible for 5 epizootics in Arizona chickens. Mortality was insignificant in young birds, but as high as 40% in one mature flock. Diagnoses were confirmed by inoculation of experimental chickens with infective whole blood. Clinical signs and necropsy lesions in experimental birds were similar to those observed in natural epizootics.

The organism stained readily by Giemsa's method and was demonstrated under darkfield microscopy. All efforts to grow the organism in artificial mediums were unsuccessful.

Pigeons and doves inoculated with infective whole blood were asymptomatic but developed a marked spirochetemia. Male rabbits and a sheep were completely refractory to testicular inoculations with infective blood.

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Restraint and Treatment of Young Chimpanzees

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James E. Cook, D.V.M., F.A.C.V.P.; Eldon D. Miksch, D.V.M.

A PRIMARY mission of the Veterinary Services Branch, Aeromedical Field Laboratory, Holloman Air Force Base, is to supply USAF research projects with healthy young chimpanzees for comparative biological studies.

In maintaining a chimpanzee colony of this nature, we have adopted specific techniques for their handling, care, and treatment which have proved effective.

Restraint

A knowledge of suitable restraining methods for purposes of examination, administration of therapeutic agents, experimental procedures, and transportation within the laboratory is of immediate necessity when new chimpanzees arrive.

Newly arrived chimpanzees 10 to 20 lb. in weight can usually be managed safely by personnel wearing heavy leather, mail-type gloves. One person should never attempt to restrain an unfamiliar chimpanzee by himself at any time regardless of its size. An adequate number of qualified personnel assures safety for both handlers and animals. Chimpanzees in the heavier weight ranges may require immobilization of all extremities and the added assistance of anesthetics or tranquilizers.

A squeeze cage is utilized for restraint purposes when no other procedure provides adequate safety for the chimpanzee or his handlers. The squeeze cage* which we prefer (Fig. 1 and 2) incorporates the following features: The back panel moves forward by a screw mechanism to approximately 8 inches from the front; the side panel then may be moved laterally, using the same type screw mechanism to contain the animal in an area of desired restraint. To accommodate this squeeze cage, all holding cages and runs are modified with a "double-door" arrangement designed to allow for easy transfer of a chimpanzee (Fig. 3 and 4).

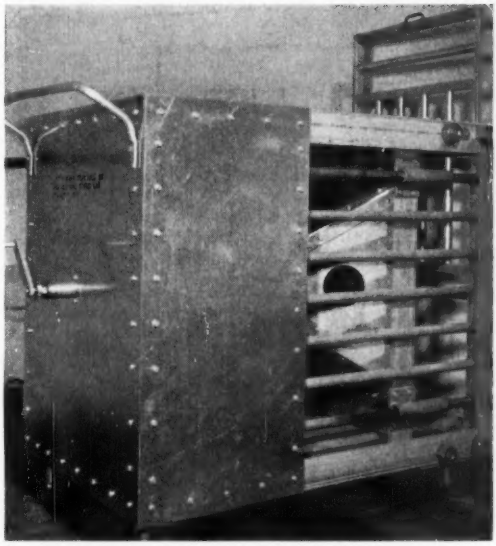

Fig. 1—Squeeze cage for restraint of chimpanzees.

Anesthetic agents and tranquilizers are employed when delicate clinical evaluations or experimental procedures are desired. As an anesthetic, we prefer thiopental sodium** administered intravenously. We use it for procedures of both long and short duration.

It is generally less depressing and the chimpanzee may be maintained at the de-

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*Designed by Dr. Jerry Fineg, Holloman Air Force Base.

**Pentothal Sodium, Abbott Laboratories, North Chicago, Ill.

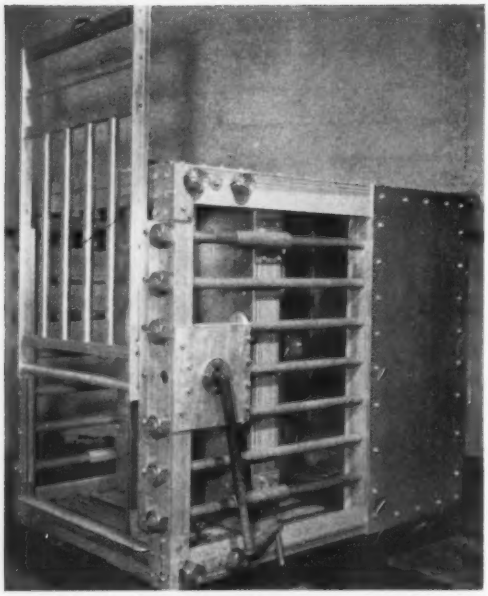

Fig. 2—Front view of squeeze cage with screw drive for side panel and sliding door. Screw drive for main panel is at left.

sired plane of anesthesia with more safety than with longer-acting barbiturates. Anesthetic agents are given until the desired effect is achieved rather than in calculated dosage; there is great variation in tolerance levels of individual chimpanzees. Tranquilizers used most extensively in our work are chlorpromazine,* prochlorperazine,** promazine hydrochloride,† and perphenazine.‡ The recommended dosage schedules have proved adequate for our work with chimpanzees.

Forcible methods of restraint may be discontinued in most instances following a 45-day quarantine, with continuous handling and adaptation of the chimpanzee to a routine.

Techniques of Treatment

In treating young chimpanzees, one must utilize all available resources. Sometimes a clinician will devise a "sure-fire" method for medicating a chimpanzee only to have the chimpanzee refuse the medication when it is presented in the same manner on the following day. In respect to the acceptance of medications, a chimpanzee behaves like a child. We, therefore, find pediatric preparations to be invaluable in our treatment of young chimpanzees.

Therapeutic agents which are palatable to human infants can usually be administered to a chimpanzee with minimum effort. Preparations readily acceptable can

*Thorazine and **Compazine, Smith Kline & French Laboratories, Philadelphia, Pa.

†Sparine, Wyeth Laboratories, Philadelphia, Pa.

‡Trilafon, Schering Corporation, Bloomfield, N.J.

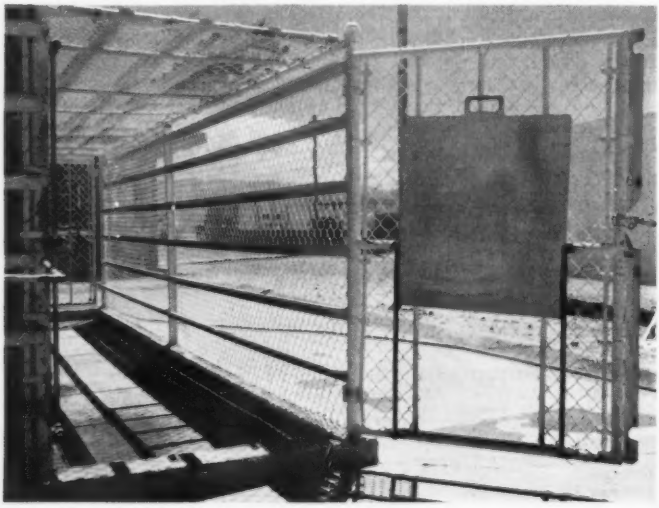

Fig. 3—Outside runs with double-door modification. Sliding panel is used.

be administered by spoon or cup. Those which are not palatable must be disguised in an acceptable base. Peanut butter, maple syrup, and fruit juices are commonly utilized as bases. An electric food blender is a useful appliance for producing a homogenous mixture of drugs and a palatable base.

A human infant feeding tube or rubber urinary catheter, 6 to 12 Fr., can be easily passed through the nares and is a valuable aid for the administration of liquid preparations. We have never found it necessary to anesthetize a chimpanzee to pass a stomach tube. For this procedure, young chimpanzees may be restrained manually, whereas a squeeze cage may be required for less tractable or adult chimpanzees (Fig. 5).

Our attempts to administer pills or capsules using a balling gun-type instrument have been unsuccessful. This procedure requires excessive restraint and usually results in traumatization of the pharyngeal region.

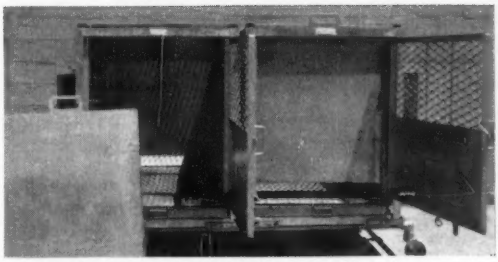

Fig. 4—Cages with "double-door" modification. A sliding panel is used.

For parenteral medication, we use the intramuscular route because of the relative ease of administration. When intravenous medication is necessary, we prefer to use the greater saphenous vein.

"Continuous drip" intravenous medication is not recommended. The main objection is the constant struggling resulting from long periods of restraint necessary for this procedure. If continuous drip therapy is used, sedation or tranquilization

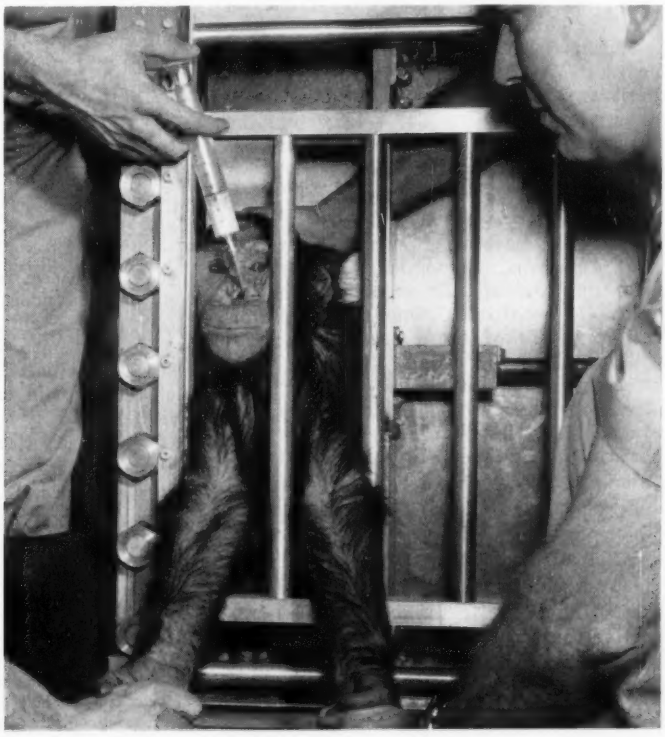

Fig. 5—Unpalatable medications are given by stomach tube through the nares. Squeeze cage is used for restraint.

must be instituted and the strapped, immobilized extremities must be massaged frequently to maintain adequate circulation.

Specific Medications — Diseases and Therapy

All newly arrived chimpanzees should be quarantined. They should be given complete physical examinations, including at least 3 consecutive daily fecal examinations to determine which enteric organisms they harbor. Attempts to eliminate these enteric organisms should be limited, except in the case of critically ill animals, until the dietary requirements have been stabilized and the chimpanzees have become acclimated to their new environment.

Enteric Diseases

Due to the manner in which chimpanzees are imported, enteric diseases caused by bacteria, protozoa, and helminth parasites will probably be the cause of most losses among new arrivals. Such diseases will most likely be due to mixed infections, with the chimpanzee harboring 2 or more pathogens, each capable of causing serious changes. We shall discuss only those organisms which have caused the greatest amount of concern in our colony, and the treatments which have proved most successful for their control.

Bacterial Diseases.—Animals with severe dysentery on arrival are usually suspected of harboring *Salmonella* or *Shigella* organisms. A stool culture is made to determine the specific organism and its antibiotic sensitivity. Due to the fulminating nature of these organisms, death will usually occur within 48 to 72 hours after appearance of clinical signs. Proper laboratory tests for identification require considerable time. Therefore, some supportive and antibacterial treatment is begun immediately on an empirical basis.

Recommended therapy includes chloramphenicol (oral suspension), 50 to 100 mg./kg. of body weight per day in divided doses, and liquid furazolidone (50 mg. 4 times daily). In severe cases, supportive therapy in the form of intravenous and subcutaneous fluids may be required to combat dehydration and anorexia. However, we have had best results using oral electrolyte preparations given via stomach tube until the chimpanzee begins eating voluntarily. In the past, we have administered normal saline solution with 5% dextrose solution, Ringer's solution, or both, intravenously, for supportive therapy of dehydration due to severe diarrhea. Recently we began using a specific product* for oral electrolyte therapy. In a limited number of cases, it has proved effective. We will probably replace the less complete solutions with this preparation.

The injection of B vitamins tends to stimulate appetites and is necessary for carbohydrate metabolism. We give 2 cc. of a commercial preparation** intramuscularly daily during periods of severe illness. Injections of vitamin B may be continued during convalescence, but we have found oral multivitamin preparations† much easier to administer after the chimpanzee regains its appetite.

Protozoan Diseases.—The 2 most common pathogenic protozoan infections found in newly procured chimpanzees are *Entamoeba histolytica* and *Balantidium coli.*

Entamoeba histolytica has been observed in approximately 50% of the young chimpanzees we have purchased in the United States. Not a single case of amebiasis was found in 40 chimpanzees purchased in Africa and brought directly to our laboratory.

A laboratory diagnosis of *E. histolytica* is sometimes difficult due to the intermittent discharge of trophozoites, cysts, or both. Stools from animals suspected of having amebic dysentery are examined several times on successive days before a negative diagnosis is made. The amebic carrier is not only a disseminator of the disease, but also has a potential clinical case, especially when aggravating agents such as *Shigella* or *Salmonella* organisms and helminth parasites are present. For this reason, all clinically healthy chimpanzees associated with infected chimpanzees are treated as well.

P-carbamino-phenylarsonic acid§ (150 to 200 mg. twice a day for 10 days), diodohydroxyquin‖ (200 mg./15 lb. of body

*Lytren, Mead-Johnson, Evansville, Ind.

**Novogram, E. R. Squibb & Sons, New York, N.Y.

†Incremin/iron, Lederle Laboratories, Division of American Cyanamid Co., Pearl River, N.Y.

§Carbarsone, Eli Lilly & Co., Indianapolis, Ind.

‖Diodoquin, G. D. Searle & Co., Skokie, Ill.

weight daily for 20 days), chlortetracycline (7 mg./lb. of body weight b.i.d.), and oxytetracycline (10 to 20 mg./lb. of body weight t.i.d. for 10 days) are fairly good amebacides. We have had best results with combinations of these drugs. A suggested course is diodohydroxyquin with oxytetracycline for 10 days, and diodohydroxyquin alone for 10 more days. We follow this with *p*-carbamino-phenylarsonic acid for an additional 10 days if indicated. *P*-carbamino-phenylarsonic acid and diodohydroxyquin tablets may be readily crushed and mixed with antibiotic syrups or maple syrup for ease of administration.

Emetine hydrochloride is a good amebacide for acute amebic dysentery. However, the therapeutic level is near the toxic dose and deaths sometimes result from it use.

Balantidium coli has been observed in almost every chimpanzee which has been added to our colony over the past 3 years. In most cases, it causes few pathologic changes. It may be associated with diarrhea and may, in severe cases, produce ulcerative colitis. Three deaths have occurred in our colony which were attributed to this parasite. The treatment is the same as that outlined for *E. histolytica.*

Helminth Parasites.—Strongyloides spp. may cause severe systemic toxemia and urticaria. During acute infections with extensive systemic migration, prevention is difficult because of the direct, indirect, and autoinfection developmental phases of the life cycle. We have observed several cases of hyperinfection in newly acquired chimpanzees in which migrating larvae were found in almost every tissue of the body at necropsy. This hyperinfective stage may be brought on by stress, change in diet, and other factors that reduce resistance.

Dithiazanine iodide* has given excellent results in removing *Strongyloides.* Because of the seriousness of strongyloidiasis in young chimpanzees, we have treated all new arrivals in our colony. Following the initial prescribed treatment, we retreat individually any chimpanzee with a stool positive for *Strongyloides* before allowing it to come into contact with the main colony. Since the drug must be given orally, we have tried several vehicles for making it acceptable. We have mixed it with peanut butter, apple butter, and syrup with little success. The most satisfactory method of administering this drug is to dissolve it in water and give the solution by stomach tube. Dosage schedule is 100 mg./10 lb. of body weight once each day for 10 days; treatment is repeated in 1 week.

Oesophagostomum spp. is commonly seen in new arrivals and, by itself, has not caused any major problems. Reinfection is prevented fairly easily because the ova require 6 to 7 days outside the host to become infective. Daily cleaning of the animal quarters is all that is usually required. Although it is easily controlled, it is advisable to eliminate this parasite because it may lower the chimpanzee's resistance to infectious diseases.

Piperazine citrate syrup (250 mg./5 lb. of body weight daily for 7 days) is effective in removing the adult parasites. This treatment is repeated in 1 week. Phenothiazine will also eliminate this nematode from chimpanzees. Phenothiazine may be incorporated in the feed (125 to 150 mg./kg. of body weight daily for 14 days).

Necator americanus (hookworm) have never been a problem in our colony, probably because of 2 factors: (1) The chimpanzees are housed in individual cages so constructed as to discourage coprophagy. By allowing fecal material to drop through expanded metal flooring and by thorough daily cleaning, reinfection is prevented. (2) There are indications that the hookworm is being successfully eradicated by the rigid treatment with dithiazanine iodide used for the elimination of *Strongyloides.*

Trichuris trichiura (whipworm) has been found in a few of our older chimpanzees. However, it apparently causes no significant damage to the host except in extremely heavy infections. Our younger chimpanzees which have been given dithiazanine iodide treatment are also free of this parasite.

Ascarides, tapeworms, and microfilaria have been found in a few instances but not frequently enough to merit discussion in this report.

Skin Diseases

Incidence of skin diseases in our colony has been negligible. We have diagnosed 4 cases of sarcoptic mange in newly acquired

*Delvex, Eli Lilly & Co., Indianapolis, Ind.

chimpanzees. Two other chimpanzees have had similar lesions, but the parasites were not demonstrated by skin scrapings or biopsies.

The 4 chimpanzees with a positive diagnosis of sarcoptic mange readily responded when they were treated with a lindane dip (0.5%) once a week for 3 weeks.

Although no parasites were found in the other 2 chimpanzees, the similarity of the lesions suggested the same treatment. This approach did not prove satisfactory. A lindane, benzyl benzoate, chlorobutanol, and phenylmercuric borate preparation* in a vanishing cream base was then applied once a week for 3 consecutive weeks by vigorous brushing with a short-bristled nylon brush. Both chimpanzees made complete recoveries.

Many iodiopathic skin conditions respond effectively to a sulfur ointment reinforced with castor oil to form an oily solution of 2 to 5% sulfur. This solution is vigorously rubbed into the chimpanzee's skin. One half of the total body is covered on successive days. Treatment is continued on a once-a-week basis until relief is effected. No sulfur dermatitis has been noticed; however, one should be alert to the possibility of its occurrence.

Respiratory Diseases

Upper respiratory infections occur most frequently in our colony during the colder months, October through April. Newly procured chimpanzees contracting pneumonia almost invariably have been insulted simultaneously with malnutrition and severe enteric parasitism. Pneumonias developing from coryza and other simple upper respiratory infections have been almost nonexistent in our colony. Diagnoses of coryza, bronchitis, and pneumonia are determined largely by clinical signs and techniques. However, attempts are now being made to identify specific agents through cultures taken from nasal swabs and necropsy specimens. Successful transmission of the common cold from man to chimpanzees by bacteria-free filtrates was demonstrated in 1930. When an immature chimpanzee "catches cold," the clinical signs are frequently similar to those observed in the human child. Common colds are contagious among the chimpanzees and spread rapidly through the colony.

Strict precautions are taken to prevent personnel with respiratory infections from coming into the animal quarters. Any chimpanzee with signs of upper respiratory infection is immediately isolated from the main colony. Special effort is made to maintain constant temperature and humidity in the animal quarters during the seasons of high incidence.

In treatment of minor upper respiratory ailments, simple symptomatic treatment will usually suffice. Dextromethorphan hydrobromide* (1 to 2 tsp. every 4 hours) and pseudoephedrine hydrochloride** (2 tsp. t.i.d.) are used for this purpose. Nasal swabs are taken, cultured and, when specific etiologic agents are isolated, drug sensitivity tests are performed and antibiotics or sulfonamides are administered singly or in combination as indicated.

Summary

A number of techniques for the care and handling of chimpanzees have been developed in an effort to maintain a standardized colony for various USAF research activities. Restraint procedures, which cause no physiologic trauma to the chimpanzee, are employed to provide adequate safety for the chimpanzee and the handlers. The medical care of chimpanzees is similar to that of human pediatrics. The human infant feeding tube and pediatric drug preparations have been invaluable in treatment of chimpanzees. Enteric parasitism and bacterial infections have been the major disease problems.

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*Mulzyl, Pitman-Moore Co., Indianapolis, Ind.

* Romilar CF, Roche Laboratories, Nutley, N.J.
**Sudafed, Burroughs Wellcome and Co., Tuckahoe, N.Y.

Repair of Perineal Lacerations in the Mare and Cow

Otto C. Straub, Dr. Med. Vet., and Murray E. Fowler, D.V.M.

OF THE VARIED types of perineal lacerations, perhaps the most difficult to repair is the 3rd-degree laceration. In this type, the anal and vulvar sphincters are severed and there is a common opening for the rectum and vagina. The vaginal vault becomes contaminated with manure; consequently, when the mare or cow comes into estrus, the cervix relaxes and an endometritis frequently develops. Most of these mares remain barren until the condition is corrected. The condition is undesirable in a saddle horse because of the "wind-sucking" noise that results.

This type of laceration is more rare in cows, perhaps because of their less violent expulsive efforts at parturition.

Review of Literature

Shortly after the turn of the century, veterinarians described perineal lacerations and offered suggestions for treatment. Each agreed that prognosis was poor. In 1908, techniques for repairing both rectovaginal fistulas and complete perineal lacerations were reported in which metal, silk, or catgut sutures were used to approximate the wound edges following debriding.[5] In 1912, it was suggested[2] that irritant agents be used to seal the defect in mild cases of rectovaginal fistulas, and surgery for severe cases. In the same year, another veterinarian[4] described an operation for the repair of perineal laceration. In a 1917 report on R. C. Moore's operation, the anal sphincter was cut dorsally to give more room in which to work. In this technique,[10] the rectal mucosa was sutured from inside the lumen of the rectum, using silk, linen, or catgut.

The classic work on rectovaginal fistulas was done in 1927.[6] Lines of stress in the rectum and the vagina were established. The technique of repair was based on 4 principles: (1) minimum tension on the sutures; (2) maximum contact of wound surfaces; (3) strong suture material; and (4) reduction of loading of rectum. This method is still preferred by many in repairing rectovaginal fistulas in the United States. The first English description of this technique was made in 1930.[1]

In 1943,[3] a technique for repair of 3rd-degree perineal laceration was described. The vaginal and rectal mucosae were separated, leaving the rectal wall as thick as possible to provide a strong shelf. The rectal mucosa was closed with interrupted sutures of No. 3 chromic catgut, with the tie in the lumen. Next, the musculofascial layer of the rectum was closed, again with interrupted sutures of catgut but with these ties on the vaginal side of the rectum. Then the anal sphincter was united. Next, the musculofascial layer of the vagina was closed, then the vaginal mucosa. In cross section, the suture pattern appeared as in Figure 1. It was recommended that the anal sphincter be cut dorsally and use of enemas or oil be avoided. This technique or modifications of it are still being used by many surgeons in this country.

A different approach to the repair of perineal lacerations in the cow was reported in 1929.[8] A modified mattress suture was used to form the shelf between the rectum and the vagina and included both structures in each suture. In cross section, it appeared as in Figure 2. In 1938,[9] the method was used in mares and cows with slight modification. The suture pattern appeared as in Figure 3. In 1952,[11] a further modification of the technique was reported in which no suture material appeared in the lumen of the rectum (Fig. 4). The technique used by the authors is a modification of Goetze's method.

Presurgical Care

To repair a perineal lacerations involving the rectum and vagina, the rectum should be relieved of as much stress as possible by withholding hay and bedding for 4 to 6 days preceding surgery. During this time, the patient may be given bran mash and grain or ground alfalfa and molasses. For 24 to 36 hours preceding surgery, all feed should be withheld.

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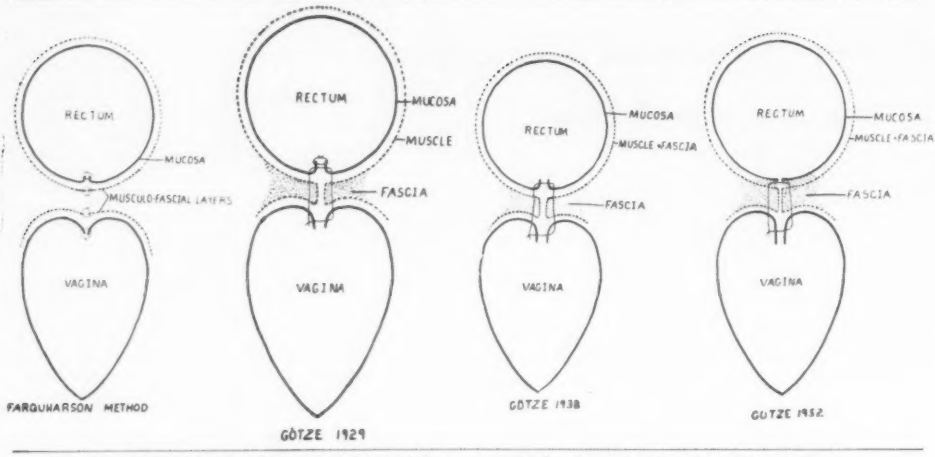

Fig. 1-4—The Farquharson (left) and Goetze methods of repair of perineal lacerations.

Epidural anesthesia is used. If there are local areas of sensitivity these may be infiltrated to obtain suitable anesthesia.

After the epidural anesthesia has taken effect, the rectum is manually emptied as far forward as possible. A prepared ball of gauze and cotton is inserted to minimize contamination of the surgical field. A length of gauze should be attached to the ball and the outside portion tied to the tail.

Only rarely is it advisable to operate immediately after laceration—only when the tear is associated with a minimum of trauma and there is little edema or necrosis of wound edges. Nearly always one should wait until the wound margins have healed and all edema and inflammation have subsided, usually 3 to 6 weeks. These wounds heal quickly in spite of contamination. Peritonitis is rare but is a possibility.

Fig. 5—Mare prepared for surgery.

The mare's tail is bandaged and tied upward (Fig. 5); the tail of the cow does not require bandaging and is tied to the neck. The perineal area is cleaned and scrubbed with antiseptic soap. Tincture of zephiran or 2% tincture of iodine is applied. The lacerated area is carefully cleaned with cotton which has been soaked with a mild antiseptic solution* until no traces of any dirt are left on the cotton.

Since sterile technique is impossible in this area, a bucket is filled with a solution of nonirritating antiseptic* into which the hands or instruments can be dipped if necessary.

As the patient is being prepared for surgery, the surgeon must evaluate the laceration to determine the exact line of incision and form a mental picture of the dissection of the rectal and vaginal mucosae to accomplish the repair.

Instruments

A few special instruments are required (Fig. 6), especially when dealing with a

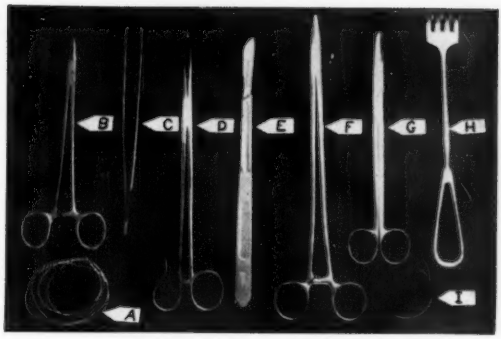

Fig. 6—Instruments needed for the operation are: (A) 0.40-mm. synthetic nylon suture, (B) 9-inch full-curved hemostat, (C) 7-inch thumb forceps, (D) White tonsil-seizing forceps, (E) scalpel, (F) 10½-inch needle holder, (G) 8-inch curved scissors, (H) rake retractor, and (I) No. 00 half-curved surgeon's needle.

long tear. Long needle holders and forceps are needed for working deeply.

Surgery

The vulva is spread by placing a curved tonsil-seizing forceps on either side. An incision, parallel to and ¼ inch interior to the mucocutaneous junction of the vulva (Fig. 7), is started at the dorsal border of the vulvar mucosa and extended ventrally as far as appears necessary. Generally, the incision is made about one third of the height of the vulva in small lacerations, and almost one half in severe lacerations.

The mucosa, along with some submucosal tissue, is separated from the perivaginal tissue to make a flap extending from the vulva diagonally to the area where the rectum and vagina are clearly separated (Fig. 8 and 9). The same procedure is followed for both sides. Any scar tissue from unsuccessful repair attempts or from healing processes should be removed, for it hampers healing.

The ventral borders of the rectal mucosa are then freshened. Hemorrhage can usually be controlled with 4- by 4-in. gauze sponges and pressure. The flaps on both sides should be as symmetrical as possible. The existing shelf is pulled posteriorly as far as practical (Fig. 10A). Undue tension in the mare should be avoided; the advantage of maximum closure is more than offset by excessive stress to the tissues, which inhibits healing. In the cow, the shelf can almost invariably be brought back as far as the vulva, thereby simplifying the process.

A long needle holder and a No. 00 half-circle needle are used to place the individual sutures (Fig. 11), which, first, go through the vaginal muosa deeply to in-

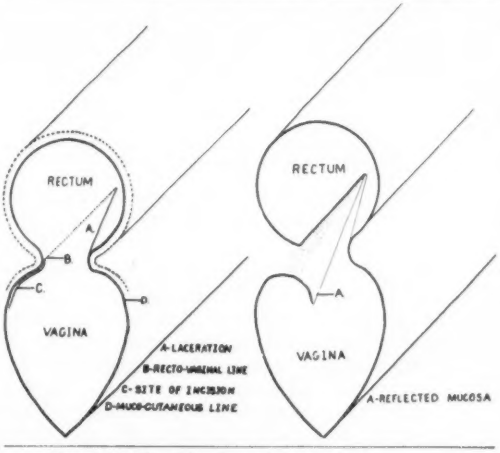

Fig. 7 (left)—Diagram of surgical area.

Fig. 8 (right)—Diagram of reflected vaginal mucosa.

Fig. 9—Reflected vaginal mucosa.

*Nolvasan, Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

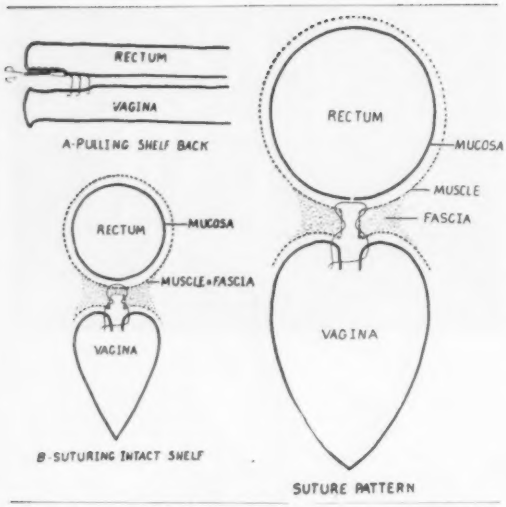

Fig. 10 (left)—Pulling rectal mucosa posteriorly (A); suture pattern with intact shelf (B).

Fig. 11 (right)—Suture pattern for repairing perineal lacerations in the mare.

clude perivaginal tissue and then come out through this tissue to the region of musculofascial defect. Next, the suture is placed deeply in the submucosal layer of the rectum on one side without penetrating to the lumen. The suture is then advanced to the other side and the submucosal layer of the rectum penetrated there. Next, the suture is placed in the perivaginal tissue and then through the vaginal mucosa to the vaginal lumen. The suturing technique is completed by passing the suture through both vaginal mucosal flaps back to the starting point where it is tied.

When the shelf is pulled posteriorly, the suture pattern appears as in Figure 10B. It is of utmost importance that the ties are pulled tight so that no slack remains. Thereby, the rectal mucosae from both sides are pulled together as well as the vaginal mucosa. To facilitate easy removal, the individual sutures are numbered by tying knots into the ends of the individual sutures, starting with one, etc. These sutures should be cut 4 to 6 inches long so they can be grasped outside the vulva for removal; however, they should not be so long that they accumulate filth or tail hairs. Sutures should be placed about ¾ of an inch apart. When all these sutures have been placed, the rectum should be carefully examined for any suture that can be palpated. Any such suture should be removed and need not be replaced if the other sutures are all satisfactory. The rectal pack is also removed at that time.

With the new shelf completed, care should be taken to furnish a good connection between the shelf and the sphincter ani. This is accomplished with single mattress sutures placed into the sphincter muscle and deeply in the upper portion of the vulva, thereby avoiding a possible pocket directly in front

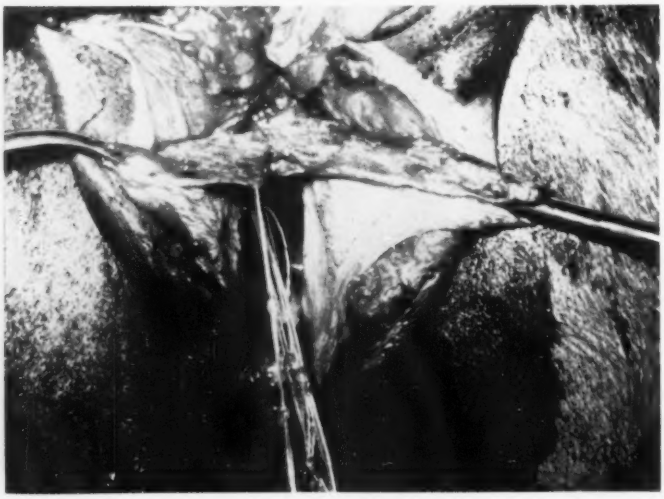

Fig. 12—Several sutures in place in perineal repair of mare.

Fig. 13—Perineal repair of mare—surgery completed.

of the sphincter. The upper part of the vulva is then sutured, either by simple interrupted sutures or by vertical mattress sutures.

Aftercare

Following surgery the animal should be given no hay. Ground alfalfa and molasses or bran mash and grain are satisfactory. This diet should be fed until the sutures are removed in 10 days to 2 weeks. Antibiotics such as penicillin and streptomycin should be given for 5 to 7 days. Occasionally the vulva is too small for natural breeding following surgery. However, the patient can be artificially bred or the vulva opened by episiotomy. Episiotomy may become necessary prior to parturition. The owner should be advised to call a veterinarian at that time.

Discussion

This technique is sometimes questioned because the rectal mucosa is not sutured

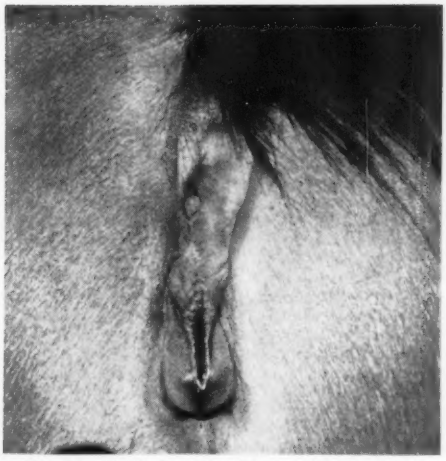

Fig. 14—Healed perineal laceration in mare.

directly. Actually the rectal mucosa is closed as if a subcuticular suture were used. The method of closure frees the rectal mucosa of sutures and minimizes possibility of infection and consequent formation of fistulous tracts. Secretion of serum seals the rectal wound shortly after surgery.

This suture pattern can be adapted to the repair of rectovaginal fistulas, in which case the anal sphincter need not be severed dorsally to prevent stress on the sutures during defecation.

The method is adaptable to any perineal laceration and provides a thick, strong shelf between rectum and vagina with a minimum of suturing.

Summary

A technique for repair of severe perineal lacerations is described, in which modified mattress sutures are used to approximate the rectal mucosa, the perivaginal fascia, and the vaginal mucosa. Sutures do not penetrate the rectal mucosa, so that infection is minimized. Packing is not necessary between the 2 mucosal layers, since all this space is closed with the sutures. First-intention healing is anticipated. This technique is best suited to 3rd-degree perineal lacerations but is also adaptable to the fistula repair.

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Toxoplasma Abortion in Sheep

In a farm flock of 97 cross-bred ewes, 14 aborted due to toxoplasmosis. Abortions commenced 4 weeks prior to the expected lambing date, and lamb mortality was 15%. In ewes there were no clinical signs of infection. There were lesions in the fetal membranes and focal necrosis in the brains, lungs, and livers of the fetuses.

Diagnosis was confirmed by histologic, serologic, and animal inoculation procedures.—*Canad. Vet. J. (Feb. 5, 1961): 50.*

Toxoplasmosis Found in Swine

Toxoplasma gondii has been isolated from pigs in Worcestershire, England. The principal signs of illness were dyspnea and wasting. Lesions and organisms were found in the lungs, liver, kidneys, and lymph nodes and the causative organism was recovered by inoculation of mice with brain tissue from the pigs' mother. Serum samples from apparently healthy pigs on the premises had titers of 0 to 1:72 in the Sabin-Feldman dye test. —*Vet. Rec., 73, (Jan. 7, 1961): 3.*

Control of the Spinose Ear Tick, *Otobius megnini* (Duges), with an Organic Phosphate Insecticide Combined with a Silica Aerogel

I. Barry Tarshis, Ph.D., and Willard D. Ommert, D.V.M.

THE SPINOSE ear tick, *Otobius megnini* (Duges), derives its name from the fact that the parasitic larval and nymphal stages generally are found in the ears of animals and that the fully developed nymphs are covered with short, heavy, peglike spines and hairs. This tick infests not only domestic animals, but also jack rabbits, deer, coyotes, mountain sheep, wildcats, and ostriches. The species is widely distributed in the arid and semiarid regions of the southwestern United States, being particularly common in parts of Texas, New Mexico, and southern California.

Where spinose ear ticks are abundant, they can cause serious damage to livestock and other animals. When the ticks pierce the tender skin in the ears of animals and suck blood, they cause the animals painful irritation resulting in inflammation. Secondary bacterial infection often follows and causes the wounds to become purulent, giving rise to the condition known as "canker ear." The ticks are generally found engulfed in an exudate consisting of their own excretions along with the wax from the ear of the animal.

The constant irritation caused by heavy infestations of ticks force some infested animals to continually shake and jerk their heads, whereas others constantly hold their heads to one side. Infested animals appear dull and worried and are extremely irritable and unmanageable. In some instances, horses are so irritated by the ticks that they will roll.

The ticks are particularly injurious to calves. Unless the calves are treated and the ticks are removed from their ears, the animals may die from the irritation. In some instances, they run about shaking and rubbing their ears until completely exhausted. The milk yield of infested dairy cattle is often reduced. Heavy tick infestations in animals also cause loss of weight and give the animals an unthrifty appearance, an especially serious problem in beef cattle. On the range, in heavily infested areas, the death of many cattle is attributable to this tick. Deaths occur mainly during the winter and early spring, particularly when feed is short and when the cattle are, at best, in poor condition.

Another serious consequence of spinose ear tick infestations in livestock is predisposition of animals to screwworm attack. Infested animals, attempting to relieve themselves of the irritation caused by the ticks, constantly rub their ears against fences and posts, trees, sides of buildings, walls, and other rough objects. This lacerates the ears and crushes some of the engorged ticks, conditions inviting oviposition by the screwworm fly.

Because of the habits of the ticks and the wide range of animals which they may infest, it has been difficult to eradicate them. It has been found that infested animals can only be treated by applying one kind of remedy or another by hand directly in the ear passages of the animals. Though

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The authors thank Mr. and Mrs. Ard D. Daniels, Georgie D. Stock Farm, Whittier, Calif.; Mr. F. Mari, Sol de Villa Ranch, La Puenta, Calif.; and Mr. Charles Morgan, Castle Hot Springs, Ariz., for carrying out the investigative work on their animals.

The California Chemical Co., Ortho Division, Richmond, Calif., supplied the test compound used in the experimental work.

such materials as kerosene, gasoline, and discarded engine lubricating oil are effective in killing ticks within the ears of infested animals, they also cause irritation

Fig. 1—Spout of polyethylene hand duster is inserted into ear of horse to treat it for spinose ear ticks. A twitch is used to restrain the horse while the dust is applied.

and inflammation of the tender skin lining the ear passages and offer little or no protection against even immediate reinfestation. Such mixtures as rotenone dust-mineral oil, benzene hexachloride-xylol-pine oil, pyridine adhesive, pine tar-cottonseed oil, and toxaphene or lindane-DDT sprays are additional remedies that have been used with moderate to good success for treating infested animals.

Literature Review

A number of investigators have shown that some arthropods can be killed when treated with chemically inactive dusts of fine particle size. The dusts kill the arthropods by removing the waterproof layer of the epicuticle through a continuous adsorption of the lipid elements, or by the abrasion of this layer. Either of these actions causes abnormal water loss from the bodies of the arthropods and leads to death.[1-12, 15-23]

In laboratory studies to determine the effectiveness of various inert dusts on household pests, the senior author found an industrial silica aerogel, SG 67, to be effective against cockroaches, fleas, ticks, lice, crickets, flies, beetles, and other insects.[13-13, 15-19]

Materials and Methods

The industrial silica, SG 67, is used as a flatting agent for lacquers, inks, and paper coatings and as an antiblocking agent for inks and paper coatings. The compound is formed when sulfuric acid is added to synthetic sodium silicate, producing a firm hydrogel which may be washed free of reaction salts. Upon drying, the purified hydrogel forms a granular dehydrated silica that can be reduced to very fine particle size.

The compound is a white, odorless, highly porous, finely divided, amorphous type of silica aerogel with an average particle size of 3 μ. It has a surface area of 300 square meters per gram and a density of 4.5 lb. per cubic foot when packed. One pound of the compound will adsorb 2.55 lb. of oil. It is composed of 95.3% silica with 4.75% ammonium fluosilicate impregnated in less than a continuous monomolecular film on the internal surfaces of the compound. The ammonium fluosilicate gives the compound a strong positive electrical charge, enabling it to adhere exceptionally well to the bodies of arthropods, reptiles, birds, and mammals and to vertical and horizontal surfaces of almost all building and construction materials. It also greatly increases the insecticidal effectiveness of the compound without affecting the adsorptive properties of the silica. The ammonium fluosilicate was added for industrial purposes completely unrelated to arthropod control.

By experiment,[16] it was shown that dimethyl 1,2-dibromo-2,2-dichloroethyl phosphate insecticide* was extremely effective in knocking down arthropods rapidly, had a fairly long residual on inert surfaces (175+ days), and was comparatively safe. The acute oral LD_{50} of this phosphate insecticide for rats is 430 mg./kg. of body weight, and the acute dermal LD_{50} for rats is 1,100 mg./kg. In subacute feeding studies, rats fed 27 days on food containing 30 p.p.m. developed no histologic, anatomic, or toxic effects. The compound is considerably less toxic than most organic phosphate insecticides and slightly less toxic than DDT.

When 2% of the phosphate insecticide was impregnated onto the silica aerogel, SG 67, the mixture knocked down German and brown-banded cockroaches 9 to 12 times faster than SG 67 alone, and oriental and American cockroaches were knocked down 18 and 23 times faster, respectively. After applying the 2% phosphate-SG 67 compound to dogs harboring feeding brown dog ticks, the ticks ceased to feed and dropped off the animals within minutes. Dogs treated with this compound remained free of ticks for 30 days.

Control with 2% phosphate-SG 67

When standardly used preparations were found ineffective for the control of spinose

*Dibrom, California Chemical Co., Ortho Division, Richmond, Calif.

ear ticks infesting Thoroughbred race horses at a stock farm in Whittier, Calif., field experiments were undertaken to determine whether the 2% phosphate-SG 67 formulation, found to be effective for the control of the brown dog tick, could be effectively used to treat the infested horses. Five horses (2 mares, 1 foal, 1 yearling, and a 3-year-old filly) were treated in the initial trials.

Each of the 5 horses had typical signs of spinose ear tick infestation: drooping head, jerking and shaking of the head, discharge from the ears, and a high degree of irritability. A twitch was used on the horses to restrain them while the ears were examined with an otoscope. The ears of each horse were found to have 75 to 100 larval and nymphal ticks engulfed in a waxy exudate. A number of ticks removed from the ears with aural forceps were well engorged. A 6th horse at the stock farm, a 3-year-old mare, was found free of ticks when the other 5 horses were examined.

Each ear was dusted with ¼ to ½ oz. of the test compound applied with a polyethylene hand duster. The long spout of the duster was placed deep into each ear and the pinna held around the spout as the dust was released (Fig. 1). After the spout was removed from the ear, the outer and inner portions of the pinna were also dusted. Minutes after the dust was applied and the twitch removed from the animal, a number of ticks were thrown from the ears of the horses as they shook their heads. These ticks were well covered with the test compound and were immobilized. The compound did not seem to have any adverse effects on the animals.

One week following treatment, all the horses' ears were free of ticks. Each ear also had a fair quantity of the dust compound still lodged within it. All the signs observed in the horses prior to treatment were gone. At this time, the 3-year-old mare was found to be infested, and it was treated at this time with the test compound.

All the treated animals remained free of ticks for a period of 28 days and then became reinfested, although the degree of infestation was slight compared with that prior to treatment. The animals were again treated with the test compound, and treatments were repeated every 10 days for several weeks. At the end of 8 months, one mare became reinfested and was retreated.

Fig. 2—The ear of Polled Hereford cow which was heavily infested with larval and nymphal spinose ear ticks in varying stages of development.

The foal became reinfested after 10 months and was retreated.

At a La Puenta, Calif., cattle ranch, 9 purebred Polled Hereford cattle and 9 Arabian horses were found heavily infested with spinose ear ticks. The head of each cow was held in a stanchion and the ears examined. The ear of each animal was infested with several thousand larval and nymphal ticks in varying stages of development (Fig. 2). The infestation in each ear extended over the entire surface of the outer auricula and inward through the external auditory meatus to the tympanic membrane. All the ticks were engulfed in a thick waxy exudate and, since they were so numerous, it was possible to scoop hundreds of them out of each ear with a curette. Most of the ticks were well engorged. Even with such heavy infestation, however, the cattle did not seem to be as irritable as the horses either at this ranch or at the Whittier stock farm.

The 9 Arabian horses were irritable and had typical signs of spinose ear tick infestations. Each horse was restrained with a twitch and, on examination with an otoscope, each ear was found to contain from 50 to 75 larval and nymphal ticks in varying stages of development. The ticks were engulfed in a thick waxy exudate.

The cattle and horses were treated with the test compound exactly as the horses at the Whittier stock farm had been treated

Fig. 3—Spout of polyethylene hand duster is inserted into ear of cow. Stanchion is used to restrain cow while the dust is applied.

Fig. 4—Immobilized ear ticks picked up from the ground after being shaken out of horses' and cows' ears 5 minutes after application of dust.

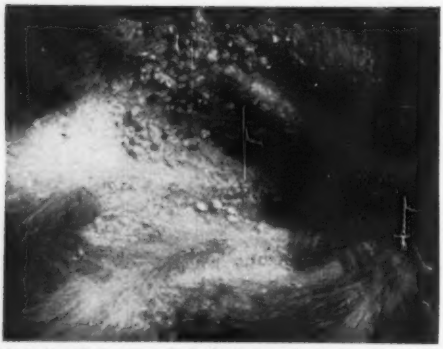

Fig. 5—The ear of Polled Hereford cow shortly after dust was applied, number of ticks in ear is reduced. The dark spots are blood spots where the ticks were attached and feeding at the time cow's ear was dusted.

(Fig. 1 and 3). Shortly after the animals were dusted and released from the restrainers, they shook their heads vigorously, scattering a number of well-dusted, already immobilized ticks from their ears (Fig. 4). Several dusted cattle were examined after this took place, and a number of blood-spotted, abraded areas could be seen on the outer auricula (Fig. 5). These were the spots where the ticks had been attached while feeding. The dust had no adverse effect on any of the animals.

One week after the initial dusting, the horses' ears were free of ticks and had a fair quantity of the dust compound still lodged within them. The cattle still had slight infestations. It was then realized that the deep fold within the ears of the cattle had been overlooked during the initial dusting and this was where the ticks were found. After this fold was dusted, the animals were free of ticks and remained free for more than a month with no further dustings. After this period, they were found to be reinfested but not as heavily as they had been prior to the initial dusting. Several subsequent dustings at varying time intervals kept the animals free of ticks for the 5 to 6 months prior to their sale.

In a 3rd field trial with 2% phosphate-SG 67 on a ranch at Castle Hot Springs, Ariz., a number of highly irritable and excitable mules, heavily infested with ear ticks, were treated with the test compound by the ranch owner. The mules were treated in the same manner, with the same quantity of material, and with equipment similar to that used on the horses at the Whittier, Calif., stock farm and the La Puente, Calif., cattle ranch. The rancher reported excellent results shortly after the mules were treated. The mules suffered no ill effects from the test compound. Several dogs heavily infested with brown dog ticks were also treated by the rancher with the test compound with equally satisfactory results. The dogs suffered no ill effects from the compound.

Summary

The sorptive dust SG 67, impregnated with 2% dimethyl 1,2-dibromo-2,2-dichloroethyl phosphate insecticide, was found to be highly effective for the control of the spinose ear tick, *Otobius megnini* (Duges), found infesting Thoroughbred race horses,

Arabian horses, mules, and purebred Polled Hereford cattle. Though all the infested animals had been previously treated on numerous occasions with a number of standardly used preparations, the ticks infesting the animal's ears had not been eliminated nor appreciably reduced by any of these preparations.

Each ear of each infested animal was dusted with ¼ to ½ oz. of 2% phosphate-SG 67 applied with a polyethylene hand duster. The long spout of the duster was placed deep into the ear and the pinna held around the duster as the dust was released. The quick knockdown of the phosphate insecticide caused a number of the ticks to become dislodged from the ears of the animals shortly after the test compound was applied. These ticks were well covered with the dust and completely immobilized. The dust did not have any adverse effect on the treated animals. One week after dusting, the ears of the animals had dust still within them.

All treated animals remained free of ticks for 28 days or longer without being redusted and then become reinfested. However, the degree of reinfestation was slight compared with the original infestations. Several subsequent dustings at varying intervals kept the animals free of ticks.

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Two Important Mastitis Facts Known

There are 2 scientific first-magnitude hard facts that we possess today concerning bovine mastitis. The first is that *Streptococcus agalactiae* is an obligatory parasite of the mammary gland and can be eliminated from the herd, although the cost may not be worth it. The second point is that we have treatments that have an action ranging from good to poor.—*James M. Murphy, V.M.D., in Proc., Mastitis Conference, Oct. 29, 1960, Chicago, Ill.*

Preparation of a "Teaser" Bull for Use in a Beef Cattle Artificial Insemination Program

Theodore H. Belling, Jr., D.V.M., M.S.

IN ARTIFICIAL INSEMINATION of beef cattle, there is difficulty in detecting range cows in estrus.[1,2,4-6] Range riders,[2] dye markers for cows,[3] vasectomized bulls, bibs on intact bulls,[10] and bulls with an amputated penis have been employed.

The bull with an amputated penis was the most satisfactory method because inherent sexual activity remained without the attendant dangers of spreading coital diseases. Amputation of the penis was performed according to a description of Vinsot's technique.[7,9] This technique is not practical on a large scale.

An easier method of surgically preparing a "teaser" bull was devised by creating an adhesion of the penis to the lower abdominal wall that would prevent protrusion of the penis.

Surgical Procedure

The operation was performed with the bull in a lateral recumbent position. Tranquilization was performed with ethyl isobutrazine* using a dose level of ¼ gr. per pound of body weight.

The area just anterior to the scrotum and rudimentary teats was chosen as the operative site. The site was clipped, scrubbed, and the skin anesthetized by a field block of 2% procaine. An area approximately 15 cm. long and 12 cm. wide extending laterally from the median line was anesthetized (Fig. 1). The penis was anesthetized by the injection of 1 cc. of 2% procaine at the sigmoid flexure.[8]

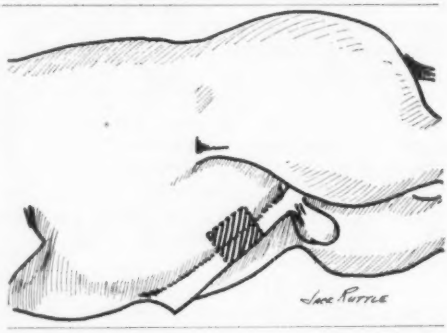

Fig. 1—Shaded area is that of local anesthesia.

After anesthesia, a 10-cm. incision was made at the reflection of the prepuce onto the lower abdominal wall.[11] Large amounts of loose connective tissue were separated by blunt dissection until the median raphe was exposed. The median raphe was scarified for approximately 3 cm. at the site for the adhesion to occur. The loose connective tissue was further separated until the penis was exposed. Towel forceps were then inserted through the incision and attached to the penis anteriorly without disturbing the anatomical relations of the penis and its surrounding structures.

The penis was then brought through the skin incision. The dorsal arteries and veins were separated by blunt dissection until the tunica albuginea of the dorsum penis was exposed. The tunic was then scarified for approximately 3 cm. to match the scarified area of the median raphe (Fig. 2). Three No. 1-0 "cable wire" sutures* were put through the tunica albuginea and the corpus cavernosum penis. They were placed

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*Diquel, Jensen-Salsbery Laboratories, Inc., Kansas City, Mo.

*"Cable Wire," United Surgical Supplies Co., Mamaroneck, N.Y.

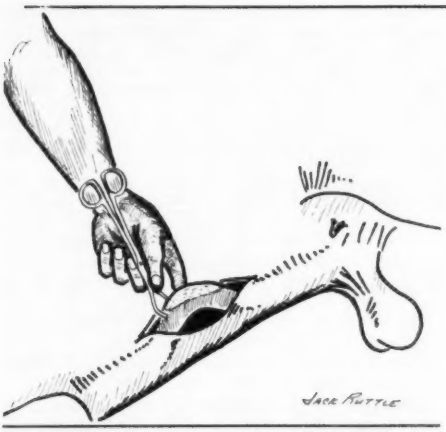

Fig. 2—Penis is exposed and scarified. Method of holding penis with towel forceps and index finger is shown.

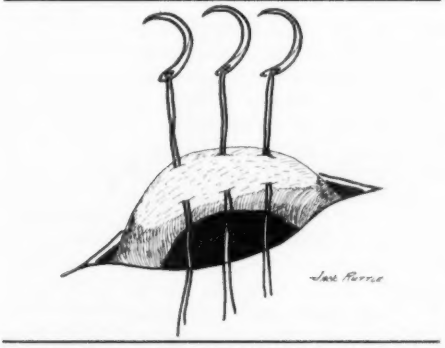

Fig. 3—Three sutures are placed in a transverse position through the dorsum penis.

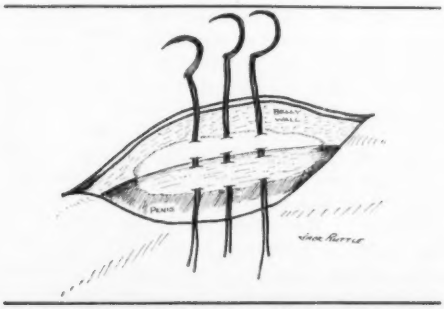

Fig. 4—Three sutures are placed in a transverse position through the dorsum penis and the median raphe immediately prior to bringing the scarified areas into close apposition.

in a transverse position with a No. 4, ½-circle taper-pointed suture needle. The sutures were placed 1 cm. apart (Fig. 3).

The penis was then replaced within the prepuce and the sutures inserted in a transverse position through the scarified area of the median raphe and tied (Fig. 4). The skin incision was closed by simple interrupted sutures of medium synthetic surgical suture.*

A combined penicillin and streptomycin preparation** was administered for 3 days postoperatively.

Discussion

There was usually some swelling on postsurgical day 1 but by day 2 the swelling had receded. When this operation was performed on young bulls (approximately 6 to 12 months old), the hemorrhage encountered was minimal. When it was performed on bulls approximately 1½ years old or older, considerably more hemorrhage was encountered when the connective tissue was dissected from the penis and the tunica albuginea was exposed. The hemorrhage was easily controlled by hemostasis and did not present a serious problem. An adhesion rapidly developed at the site of the apposition of the penis to the abdominal wall.

Attaching the towel forceps to the penis before withdrawing it from the prepuce accomplishes 2 things. It helps the surgeon maintain the proper relationship so that the penis may be scarified on the dorsum penis. It also serves as a landmark for scarification of the penis to correspond with the scarified area of the abdominal wall.

The operation may be performed with the bull in either a standing or a lateral recumbent position; choice of position depends upon the facilities and the wishes of the operator.

Previous failures encountered while developing this technique indicate that the following steps must be followed if the operation is to be successful:

1) The loose connective tissue must be dissected away to expose the tunica albuginea of the dorsum penis.

2) The tunica albuginea and the median raphe must be scarified prior to suturing.

*Vetafil, S. Jackson, Washington, D.C.
**Streptillin, Trico Pharmaceutical Co., Denver, Colo.

3) The penis must be brought into very close apposition to the abdominal wall.

4) Stainless steel sutures must be used.

5) The bull must be free from sexual excitement for 1 week to allow a strong adhesion to form.

Summary

A surgical procedure to prepare a bull for use as a "teaser" in a beef cattle artificial insemination program was developed in which adhesion of the penis to the abdominal wall was induced. Concomitant dangers of coital disease or sexual fatigue are minimized.

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Pregnancy Diagnosis of Swine by Rectal Examination

Diagnosis of pregnancy in sows is often impossible either by ballottement or palpation of fetuses. However, it is possible to palpate the external iliac artery, even if the hand cannot pass through the pelvis. In mature swine, this artery is at least as thick as a pencil and easily recognizable by the strong pulse. It extends along the cranial border of the ilium. By palpating along this artery, the middle uterine artery, which courses through the broad ligament of the uterus and crosses the external iliac artery cranioventrally, may be located.

In the nonpregnant sow, the middle uterine artery has the thickness of a stalk of straw and never attains the diameter of the external iliac artery at the junction of the 2. In the sow in advanced pregnancy, however, both arteries have the same thickness, or the middle uterine artery is thicker. The "buzzing" of this artery, as described in the cow as a sign of pregnancy, also occurs in the sow. Pregnancy may reliably be diagnosed by palpation when the middle uterine artery is as thick or thicker than the external iliac artery. This thickness is attained beginning with the last month of pregnancy. A diagnosis of "not pregnant" may be made when the middle uterine artery is not enlarged and the sow has reached what is presumed to be the 3rd month of pregnancy in relation to the last mating date. A distinctly palpable uterus about 2 fingers in thickness also indicates a nonpregnant condition in the sow.

The ability to make rectal examinations in sows depends on the size of the operator's hand and lower arm and also upon the size of the sows. Generally, sows weighing less than 325 lb. are not considered for examination. Because of the relatively small size of the rectal lumen, palpation must be performed with a slightly pointed, closed hand and with considerable care. If peristaltic contractions occur, the hand must be withdrawn immediately, otherwise rupture of rectal muscles may occur. In this study of 100 sows, no damage was known to occur as a result of examination.—*Tierärztl. Umschau, 15, (1960): 399.*

Editorial

Medical and Nonmedical Roles for Veterinarians Following Nuclear Attack

Although the thought of nuclear warfare is never pleasant, it has to be given serious consideration because almost any country, large or small, soon may possess the means of developing or acquiring nuclear weapons. If a nuclear disaster should occur in this country, veterinarians as a specialized professional group will be expected, along with many others, to contribute heavily of their talents to make possible the survival of as many of our people as possible.

At present, the role of veterinarians surviving a nuclear attack is considered to be twofold: medical and nonmedical. The medical aspects concern the application by veterinarians of basic medical knowledge to medical problems of man. The veterinarians most appropriate for such activities would be practitioners, particularly those with hospitals and those actively engaged in small animal practice. These veterinarians would not function as physicians but as members of first-aid teams under the direction of medical practitioners. They would, under medical supervision, treat human beings for shock and burns, give surgical attention to wounds, treat fractures, and administer parenteral medications and anesthetics. Detailed functions of veterinarians in this regard have been outlined by the American Medical Association in a special bulletin (*see J.A.V.M.A.*, Feb. 1, 1960: page 140).

In their nonmedical role, veterinarians will be expected to evaluate the acceptability of foodstuffs which may have been exposed to radioactive contamination and to supervise decontamination. Food products contaminated with radioactive materials can be just as lethal to the consumer as traumatic injury resulting from a bomb blast. Veterinarians responsible for nonmedical radiation emergency programs will not necessarily function as assistants to others, but often as the solely responsible professional group.

Most veterinarians, if called upon following a nuclear attack to judge the safety of food products for man and animals, could offer only little more help than an untrained layman. Obviously, a veterinarian dealing with radioactivity problems no more complicated than his x-ray equipment does not possess sufficient knowledge of radiation hazards resulting from a nuclear attack to direct a program concerning them. Knowledge of how to cope with radioactivity is specialized, and training time and effort are required. The veterinarian who must assess radiation damage and direct decontamination procedures must be familiar with the operation and calibration of monitoring devices such as dosimeters and geiger counters. He must be able to give counsel concerning the protective effects of different types of building construction and materials. He must understand and be able to explain the methods for decontaminating feed and pastures exposed to radioactive contaminants. He must be able to demonstrate methods of decontaminating food products for human consumption. He must be able to give reliable advice on how to slaughter and salvage exposed meat animals, and he must be able to diagnose radiation damage on the basis of clinical signs and lesions.

So far, training has been given to a limited number of veterinarians. About 360, mostly military veterinarians, have attended the 2-week course at the Oak Ridge Institute of Nuclear Studies in Tennessee. Praiseworthy but limited attempts have been made in the form of 2- to 5-day short courses such as that given for regulatory veterinarians at the University of Wisconsin last April (*see J.A.V.M.A.*, June 1, 1961: page 631). The remainder of the training effort has been of a relatively low order of effectiveness, because it depends almost entirely on occasional publication of articles in professional journals and occasional lectures or motion pictures at professional meetings.

Although the veterinarians who initially will be expected to supervise radiation safety and decontamination programs will be specially trained military, public health, and regulatory personnel, those engaged in farm animal practice will also be called upon because livestock, pastures, and feeds in extensive rural areas can become contaminated with radioactive fallout. Consequently, these practitioners must be adequately equipped to give reliable advice concerning radioactivity problems. They must be willing to accept this important responsibility in the nation's defense program. Information and educational courses can be obtained by having a local association representative contact his state's federal inspector in charge* and request speakers or instructors to conduct a program or short course. Those who attend the course will find the subject a fascinating one.

We should all accept responsibility for stimulating increased demand for knowledge pertaining to radiologic defense and encourage development of attractive training courses. The lives of countless animals and persons, including our own, may depend on how well we get this job done.—A.F.

*Federal Veterinarians in Charge, Animal Disease Eradication Division, and their addresses are listed in the 1960 AVMA Directory on page 63.

Opportunities for Veterinarians Increase

Each year the colleges receive a greater number of requests for veterinarians to fill positions in institutions or corporations where veterinarians were never employed before. Every year, a larger number of our graduates become involved in basic medical research. More and more medical schools are employing veterinarians in full faculty status. More and more state and local governments are establishing positions for veterinarians. Interprofessional associations in which veterinary medicine is included are being formed in many states. State medical societies are beginning to appoint veterinarians as advisers on some of their committees. Veterinarians are also exerting a broader influence in government and education. At Michigan State University, the nation's 8th largest, a veterinarian as dean of the college of science and arts presides over departments of English, history, art, and music, as well as subjects more closely related to his scientific training. Also at Michigan State, the chairman of the board of trustees is a veterinary general practitioner who is serving his 12th year on the board.

In the U.S. Air Force, which must play a leading role in the coming age of space travel and exploration, veterinarians have acceded to positions of great importance and responsibility. Chief of the biomedical division of the Air Research and Development Command in Washington is a veterinarian. Chief of the bioastronautics branch of the Aeromedical Field Laboratory in New Mexico is a veterinarian. Chief of the acceleration section of the Aeromedical Space Laboratory at the Wright Air Development Center at Dayton, Ohio, is a veterinarian who has been out of school less than 7 years. In fact, wherever man is pushing back the frontiers of biomedical ignorance, veterinarians will be there in increasing numbers. The future undoubtedly holds promises of veterinarian participation in fields undreamed of today.—*W. W. Armistead at the Illinois State V.M.A., Chicago, Feb. 20, 1961.*

Chicken Sarcoma (Strain 13)

The bursa of Fabricius has been shown to play a part in natural resistance in chickens and in antibody formation. Chicken sarcoma (strain 13) is a virus-induced tumor. Two experiments were conducted with a single exposure in the bursa and, when the tumor failed to grow in the bursa, a 3rd experiment was tried with 2 exposures, 3 weeks apart. In the 1st 2 experiments, 4 weeks was allowed for resistance to develop, after which the exposed chickens together with an equal number of controls were challenged by intramuscular injection. In the 3rd experiment, 2 weeks was allowed after the 2nd exposure, considered the optimum for antibody production, at which time exposed chickens were challenged by intramuscular injection. Under these conditions the tumor failed to grow in the bursa, and no evidence was found that any resistance against this tumor had been produced.—[*E. L. Stubbs and F. G. Sperling: Study of Chicken Sarcoma (Strain 13) Placed in the Bursa of Fabricius. Am. J. Vet. Res., 22, (Jan. 1961): 154-155.*]

Diagnoses of Preclinical Lymphosarcoma

This study was conducted to investigate preclinical hematologic changes in cattle in a herd in which there were frequent clinical cases of lymphosarcoma. The herd studied had a number of cattle with what were described as preclinical hematologic changes. Clinically normal cattle that have a permanent increase in lymphocytes as compared with normal standards are tentatively classified as being preclinically affected. This finding agrees with the studies of others.—[*G. H. Theilen, O. W. Schalm, and V. Gilmore: Clinical and Hematologic Studies of Lymphosarcoma in a Herd of Cattle. Am. J. Vet. Res., 22, (Jan., 1961): 23-31.*]

Complement-Fixation Antigens in Bovine Tuberculosis

In a study on the complement-fixation test for bovine tuberculosis, 114 antigens were prepared from host tissue, the tubercle bacilli, and their metabolites. Antigens were screened by serum samples from: (1) tuberculous cattle, (2) cattle sensitized with heat-killed Calmette-Guerin bacillus, and (3) normal cattle. The best antigen was in the supernatant fluid from a mixture of normal dried bovine intestinal mucosa and *Mycobacterium tuberculosis* var. *hominus* exposed to ultrasonic vibrations. This mixture had been refluxed, the pH adjusted, and centrifuged. An antigen of nearly equal activity was similarly prepared from *Myco. tuberculosis* var. *bovis*.—[*T. H. Vardaman and A. B. Larsen: Bovine Tuberculosis—Studies of Complement-Fixation Antigens. Am. J. Vet. Res., 22, (March, 1961): 204-208.*]

Post-Tetanic Potentiation in Myoclonic Pigs

The effect of dorsal root tetanization on the 1st sacral segmental reflex was tested in 31 pigs. The responses were analyzed with respect to duration of monosynaptic and duration of 2nd wave potentiation to the 70% relaxation level, and comparative maximum amplitudes of 1st and 2nd waves following dorsal root termination.

With respect to the aforementioned characteristics, marked differences were demonstrated between control pigs and pigs with tremor of myoclonia congenita. Less marked

differences were observed between control pigs and recovered pigs.

The nature of the spinal cord reflex response in pigs with tremor suggests increased excitability via 2-neuron-arc pathways and decreased excitability via multineuronal pathways.

The possible significance of these characteristics in relation to the generation of tremor is discussed. The similarities to normal shivering are pointed out and, on the basis of the data, a theory of the neural mechanism of this type of tremor is proposed.—[*M. W. Stromberg, R. L. Kitchell, and R. C. Callstrom: Post-Tetanic Potentiation in Spinal Cords of Normal and Myoclonic Pigs. Am. J. Vet. Res., 22, (Jan., 1961): 72-79.*

Inoculation of Microbes into Intestines of Small Animals

A procedure is described for making enteric microbial inoculations into the intestines of small experimental animals. The method, which was perfected with the laboratory rat, may also be applied to larger experimental animals. The inoculation process was studied by the use of simulated gastric and intestinal fluids, bacterial colony counts, and roentgenography.—[*R. B. Johnson and D. A. Peterson: Inoculation of Microbes into the Intestinal Tracts of Small Animals. Am. J. Vet. Res., 22, (March, 1961): 330-332.*]

New Books

Milestones in Microbiology

This collection of 55 articles is intended as a supplement to work done by undergraduate students in microbiology. It should also prove to be an interesting and useful reference for advanced students and practicing microbiologists. The articles are unique in that they are translations of the original works of prominent microbiologists, such as Leeuwenhoek, Pasteur, Lister, Koch, Ehrlich, Fleming, Petri, and von Behring. Most articles have been abridged to keep the size of the book within reasonable limits and reduce verbose discussions of material which seem to have little significance historically.

The collection is restricted to subjects pertaining to bacteria, viruses, and yeasts, and is medically oriented.—[*Milestones in Microbiology. Edited by Thomas Brock. 275 pages; illustrated. Prentice-Hall, Inc., Englewood Cliffs, N.J. 1961. Price $3.95.*]

Comparative Medicine in Transition

This volume is a record of the deliberations and proceedings of the First Institute on Veterinary Public Health Practice held at the University of Michigan School of Public Health, Oct. 6-9, 1958. As a group effort, it represents a summary opinion of methods and techniques for implementing contributions by veterinary medicine for the benefit of the public welfare. There are over 60 contributors most of whom are veterinarians, but a number of whom are physicians; most are affiliated with the Public Health Service. The 14 chapters deal with such subjects as experimental medicine, laboratory administration, biological and pharmaceutical production and control, food hygiene, chronic diseases and geriatrics, military veterinary medicine, and radiation and civil defense. Each chapter includes abstracts, comments, and committee conclusions.—[*Comparative Medicine in Transition. Proceedings of the First Institute on Veterinary Public Health Practice. 499 pages; illustrated. University of Michigan School of Public Health, Ann Arbor, Mich., 1960. Price not given.*]

Hog Cholera Eradication Bills Introduced

Three similar bills calling for a nationwide hog cholera eradication program were introduced in Congress May 18.

The bills follow closely the legislation proposed by the hog cholera eradication committee of Livestock Conservation, Inc., and supported by the AVMA. AVMA representatives travelled to Washington, D.C., last April to point out the need for such legislation and urge cooperation in securing it.

A memorandum was also sent by AVMA to 61 state and regional associations urging all constituent veterinary medical associations to familiarize their entire membership with the program and to support its adoption and execution.

Senator Talmadge of Georgia introduced S.1908 in the Senate. His bill was cosponsored by Senators Hickenlooper of Iowa, Mundt of South Dakota, Young of North Dakota, Hart of Michigan, Eastland of Mississippi, Holland of Florida, and McCarthy of Minnesota (*see* Washington News, adv. page 12).

Similar bills (H.R.7177 and H.R.7176) were introduced in the House of Representatives by Congressmen Harvey of Indiana and Grant of Alabama.

Below are the comments of Senator Talmadge when he introduced the bill, as reported in the *Congressional Record,* May 18, 1961.

"Mr. Talmadge: Mr. President, on behalf of myself and Senators Hickenlooper, Mundt, Young, Hart, Eastland, Holland, and McCarthy, I introduce, for appropriate reference, a bill to initiate a national program for the eradication of hog cholera.

"Of the diseases which confront the hog producers of this country today, hog cholera is considered to be the most serious. This disease is estimated to cost our hog producers an annual loss of over $50 million, including the costs of the vaccination program for its prevention.

"In addition to our domestic losses sustained as a result of hog cholera, this disease has also caused a restriction of our exports of pork. Some 11 countries now prohibit or restrict the importation of pork produced in the United States. Equally as important, if not more so, is the fact that we run the risk of having Canada, which is a substantial importer of our pork, place restrictions on our exports if we fail to eliminate this disease.

"This disease can be completely eliminated with a concerted national program. This has been vividly demonstrated by Canada which has had a very successful program for years. As a result, Canadian pork producers pay [for vaccination alone] only an average of one-half cent prorated per hog marketed for the entire program, as opposed to a prorated cost of 42 cents per hog sold in the United States.

"Many states have expressed an interest in a national eradication program and have taken active steps to stamp out the disease on their own. It is generally recognized that a federal program will be needed to control the interstate movement of hogs since such movements of swine could introduce the disease into areas where it had been eradicated.

"The program as envisioned under this bill is to be carried out in cooperation with the states on a federal-state matching basis. Both federal and state officials would work together in detecting and proving cases of hog cholera. Diseased animals would be condemned by the particular state involved and destroyed. The costs of indemnifying the owners would be shared by the federal and state governments on a 50-50 basis.

"The proposed bill is self-explanatory, and I ask unanimous consent that the text will be printed at this point in the *Record.*"

The bill was referred to the Committee on Agriculture and Forestry and ordered to be printed in the *Record.*

Toward Better Service

As the veterinary profession forges ahead to greater knowledge and achievements, veterinarians' duties increase proportionately. To keep pace with this ever-mounting work load, veterinarians across the country are finding it necessary to hire receptionists, secretaries, office girls, and assistants. These women are being trained by their employers to handle some of the routine work that practicing veterinarians now have difficulty finding time to do themselves.

This trend has not gone unnoticed within the profession. Special articles have begun to appear in veterinary publications on the value of well-trained assistants to a practitioners' professional operation. Stories on the public relations importance of veterinary medical assistants, personalities that please, telephone techniques, sound office procedure, and appointment scheduling are becoming commonplace in veterinary literature.

In Alameda-Contra Costa County, California, the veterinary assistants themselves have recognized the effect their work has on the practices of their employers. To prepare themselves to provide more efficient service, these women have formed an educational organization, the Alameda-Contra Costa Veterinary Medical Assistants Association. Its major goal is to "inspire its members to render honest, loyal, and more efficient service to the profession and to the public which they serve, and to render educational services for the self-improvement of its members."

This is the first formal organization of veterinary medical assistants. Realizing that their organization may set the pattern for the formation of similar groups across the country, the assistants have requested and received the assistance of the Alameda-Contra Costa Veterinary Medical Association in planning an organization that will work with and be a credit to the veterinary profession.

The assistants requested that the Alameda-Contra Costa V.M.A. appoint 3 advisors to their organization to help them plan programs geared to filling the needs of the veterinary profession. Veterinarians appointed to assist the group are Drs. J. N Henry (COL '42), D. B. Martin (WSU '53), and C. J. Parshall (COR '28).

In a letter sent to the veterinarians by the

—Oakland Tribune Photos

Two other association members, Madeline Edwards and Sherry Riley, prepare a dog for examination.

Alameda-Contra Costa V.M.A.A. members Ellen Hageman and Helen Bale are shown using a microscope and preparing radiographs for study.

Mr. Kenneth Humphreys, California V.M.A. executive secretary, spoke to the veterinary assistants at a recent meeting about their role as public relations ambassadors for their veterinarian-employers. Shown with Mr. Humphreys are (left to right): Mrs. Ellen Hageman, publicity chairman; Mrs. Lou Kreamer, president; and Mrs. Jean Potts, secretary.

22 charter members of the assistants' group, they stated, "One point we want to make clear right from the first is that we do not intend to use our organization for any financial benefits whatsoever." They explained in the letter that the purpose of their organization was to improve their on-the-job performance and to learn more about the veterinary profession so that they might better serve their employers.

Although the Alameda-Contra Costa Veterinary Medical Assistants Association was just one year old last March, they have already completed their constitution and by-laws and are now drawing up a charter with the hope of becoming incorporated as a nonprofit organization in California.

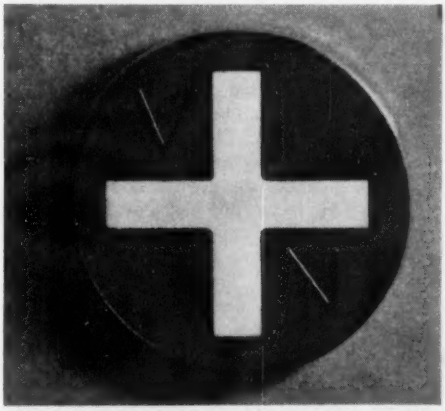
Committees have been set up to handle education, program planning, membership, publicity, business, and social activities of the association.

Their educational program during their first year included talks on public relations, telephone techniques, and urinalysis in small animal medicine. Because their membership is made up of women assisting with office treatment, hospital treatment, surgery, and office duties, they are attempting to strike a balance in their programs in securing speakers on both the scientific and business sides of veterinary medicine.

Membership in the organization is open to women who have been under the supervision of licensed veterinarians for at least one year and who furnish endorsement by their employers on an association qualification form. Pins and certificates approved by the Alameda-Contra Costa V.M.A. are presented to members. The certificates are signed by the veterinarian-employers who affirm elegibility for them.

The California assistants have begun what may develop into a nation-wide program. Through several brief articles that have appeared in veterinary publications about their organization, they have received a steady flow of mail from veterinary assistants throughout the United States who are interested in forming similar groups.

About 10 years ago, similar groups of medical assistants began forming locally



This pin is presented to members of the Alameda-Contra Costa Veterinary Medical Assistants Association.

throughout the country. Like the veterinary assistants, their goal was educational and they secured the approval of local medical societies. In 1956 a national organization, the American Association of Medical Assistants, was formed by the local and state medical assistants groups. The purposes and objectives of the AAMA were given an official commendation by the House of Delegates of the American Medical Association.

Today AAMA has more than 9,000 members in at least 25 states. All of these women are participating in intensive educational programs to better equip themselves to serve their physician-employers and their patients.

University of Illinois Conference, Gaines Symposium Merge

The 1961 University of Illinois Veterinary Medical Conference and Short Course and the Gaines Symposium will be held jointly this year. Both conferences will be held at the University of Illinois, Urbana, Oct. 19-20, 1961.

The Gaines Symposium, "The Newer Knowledge about Dogs," was for the past 10 years held at Kankakee, Ill., by the Gaines Dog Research Center, New York, N.Y. A grant by the Gaines Dog Research Center will enable the University of Illinois to carry out the symposium.

The small animal session of the conference will be held on October 20 in the afternoon.

Laboratory Animal Medicine Examination Scheduled

The examination for the American Board of Laboratory Animal Medicine will be held at the AVMA convention in Detroit in August. Applications to take the examination must be filed before Aug. 1, 1961.

To be eligible to take the examination, the candidate must: (1) be a graduate of a veterinary school recognized by the AVMA; (2) be a member in good standing of the AVMA; (3) have an M.S. or equivalent degree from a recognized university and at least 5 years' experience in laboratory animal medicine and have made a distinct contribution to the advancement of laboratory animal medicine (3 years of additional experience and recognized accomplishments in the field may be substituted for the advanced degree); (4) submit with his application a written statement containing information to enable the Board to judge the suitability of the candidate's abilities, training, and experience.

Application forms and further information may be obtained by writing to Dr. Robert J. Flynn, secretary-treasurer of the American Board of Laboratory Animal Medicine, Argonne, Ill.

New Group Formed to Set Guides for Radiation Safety

Assisting nations of the western hemisphere in setting up safety standards for using ionizing radiation is the task facing the newly established Radiation Protection Unit of the Pan American Sanitary Bureau.

"Radiation is being used more and more in medicine, in industry, and in agriculture. This use is going to grow rapidly. The greater the use, the greater potential hazards to human health," says Dr. Irvin M. Lourie, the new unit's chief.

"We are here to help the governments of the Americas eliminate these potential hazards when possible, or at least to reduce them to a minimum."

The 2 biggest sources of ionizing radiation are radiographs and radioisotopes. Radiographs are already widely used throughout the hemisphere. Radioisotopes are used extensively in the United States and their use is growing in Latin America.

Laws governing the safe use of ionizing radiation from all sources are needed by the health services in the Americas. Registration of all radiation sources, for example, is of prime importance.

"Not only physicians, but veterinarians, dentists, and many other professionals of the healing arts use radiographs daily," Dr. Lourie explained.

"Until all such equipment is registered, the governments have no way of knowing

exactly where and how much ionizing radiation is being employed and consequently they find it difficult to reduce possible unsafe use."

The Bureau unit will help the Latin American nations in launching radiation protection programs to meet their future needs. Among the areas in which the unit will work with the governments are: setting up radiation protection education programs, encouraging the use of radioisotopes in medicine, fostering the establishment of international isotope centers for training international as well as national personnel, promoting research, and in drafting radiation protection legislation.

The PASB unit also expects to work with the governments in training professional and para-professional personnel in the latest radiation protection techniques.

The Bureau and the governments will cooperate in setting up courses, in calling seminars, and in establishing education standards for the new field.

The Bureau also hopes to aid the countries in launching inter-country or-regional programs for training radiation protection workers. Above all, it hopes to pass on to the countries the experience of other nations and thus lessen the time and expense involved in setting up individual programs.

International Veterinary Education Panel Formed

An international panel on veterinary education has been established by the Food and Agricultural Organization of the United Nations and the World Health Organization.

The panel was formed in compliance with a recommendation made at the International Meeting on Veterinary Education in London in April, 1960.

The panel will "study all details concerned with veterinary education in various regions of the world." There are 11 members of the panel who have been nominated to provide for geographical representation of the world. Panel members are: Dr. William A. Hagan (KSU '15), United States; Dr. T. Lloyd Jones (ONT '34), Canada; Prof. C. Bressou, France; Dr. El Nazir Dafaalla, Sudan; Dr. R. M. C. Gunn, Australia; Prof. S. R. Numans, Netherlands; Dr. T. Ramos Saco, Peru; Dr. R. Rastegar, Iran; Sir John Ritchie, United Kingdom; Dr. L. Sahai, India; and Prof. J. Jansen, World Veterinary Association.

The initial work and investigations will be conducted by correspondence. Information will be correlated at FAO headquarters and circulated to panel members and cooperating bodies all over the world. The panel will act as a clearing house for information on veterinary medical education throughout the world.

The panel will meet early in 1962 when the material collected by the 11 members will be reviewed and panel recommendations will be prepared.

Epidemiologic Orientation Course Given

A 5-day course on epidemiologic orientation for veterinarians was given at the Public Health Service's Communicable Disease Center in Atlanta, Ga., April 17-21.

The course, attended by 40 state and federal veterinarians, was the first of 3 being presented by the Public Health Service in cooperation with USDA.

It was concerned with diseases of farm animals. The session was under the direction of Dr. Daniel Weiner (UP '55) of the CDC Training Branch, and was coordinated for the USDA by Dr. E. E. Wedman (KSU '45).

The other 2 courses will be given in Kansas City, Mo., beginning May 22; and in Salt Lake City on June 19.

Veterinary Anatomists Meet

The American Association of Veterinary Anatomists held its annual meeting in Chicago, March 20-21, 1961. The meeting was attended by 21 members of the association.

During the 2-day session, 8 scientific papers were presented. They were:

"Histologic and histochemical effects of DDD on goat adrenals, pituitaries, livers, and kidneys," by Dr. J. T. Bell, Jr. (GA '52), Michigan State University;

"Comparative histology of the seminal

Veterinarians who attended the meeting of the American Association of Veterinary Anatomists in March are shown here. They are (top row, left to right): Dr. J. Breazile, University of Minnesota; Dr. N. Bjorkman, Washington State University; Dr. R. Hadek, University of Chicago; Dr. B. Hart, University of Minnesota; Dr. L. Julian, University of California; Dr. T. Holliday, University of California; Dr. G. Christensen, Purdue University; Dr. R. Kitchell, University of Minnesota; Dr. R. Brown, Michigan State University; Dr. H. Evans, Cornell University; Dr. A. Safanie, University of Illinois; and Dr. L. Calhoun, Michigan State University. Seated are (left to right): Dr. A. Weber, University of Minnesota; Dr. E. Smith, Michigan State University; Dr. D. Lee, University of Pennsylvania; Dr. R. Getty, Iowa State University; Dr. L. St. Clair, University of Illinois; Dr. R. Notzold, University of Illinois; Dr. R. McClure, University of Missouri; and Dr. T. Bell, Michigan State University. Drs. T. Jenkins, Michigan State University, and W. Tyler, University of California, were not present when the picture was taken.

vesicles of the domestic animals," by Dr. M. Lois Calhoun (ISU '39), co-authored with Dr. M. B. Bharadwaj, Michigan State University;

"A functional approach to the study of specific coronary vessels through the use of rapid angiographic techniques," by Dr. G. C. Christensen (COR '49), Purdue University;

"Electron microscopic study on the oocyte and blastocyst in the rabbit," by Dr. R. Hadek, University of Chicago;

"Fiber sizes of the biceps brachii muscle of dogs which differ greatly in body size," by Dr. L. M. Julian (WSU '46), University of California;

"Studies on the vascularity of the intervertebral disk of the cat," by Dr. Donald G. Lee (UP '36), University of Pennsylvania;

"Histologic, cytologic, and *in vivo* studies of canine mast cell tumors," by Dr. Esther M. Smith, co-authored with Jean Juday, Michigan State University; and

"The distribution of the bronchial artery of the horse," by W. S. Tyler (MSU '51), University of California.

Dr. N. Bjorkman, a member of the Veterinary Anatomy Department of the Royal Veterinary College, Stockholm, Sweden, who is presently studying at the University of Washington, Seattle, also attended the meeting.

Dr. G. C. Christensen, Purdue University, was elected as the American Association of Anatomists' representative to the meeting of the governing board of the American Institute of Biological Sciences.

The meetings of the American Association of Anatomists and the American Association of Veterinary Anatomists were held concurrently.

Senegalese Ambassador Is a Veterinarian

The Ambassador to the United States and to the United Nations from Senegal, Africa, is a veterinarian.

This fact was uncovered by the Veterinary Medical Association of New Jersey which invited him to speak at their convention last March and awarded him an honorary membership in their association.

Ambassador Ousmane Soce Diop, when contacted by the New Jersey association, said that although he has met President Kennedy and has been to many diplomatic functions, the V.M.A. of New Jersey was the first private, nonpolitical organization to call upon him. Although he is a man of many interests and talents he has maintained a vital interest in the veterinary profession and gladly accepted the invitation to speak at the meeting.

Ambassador Ousmane Soce Diop of Senegal, guest speaker at the V.M.A. of New Jersey, Convention, visits with Drs. Robert R. Shomer (left), chairman of the public relations committee, and Robert L. Ticehurst, president.

Dr. Diop not only is a veterinarian, but also is an author, poet, magazine editor, mayor of a city of 60,000, and deputy to the French community of his nation. He served in the French senate for 15 years. He has written 2 novels, one of them a literary prize winner, and a volume of poetry.

He holds his veterinary degree from Alfort University, France, and the University of Paris. His thesis concerned experiments in the use of cobra venom in cancer research.

In his speech before the V.M.A. of New Jersey, Dr. Diop said that French veterinarians are still assisting Senegalese veterinarians in his country. However, when the 10 Senegalese students now attending Alfort receive their veterinary degrees, there will be 14 Senegalese veterinarians—enough to carry on the work in Senegal without outside help.

American Veterinarian Guards Health of Animals at Cairo Fair

Dr. Nels Konnerup (WSU '42), veterinary analyst with the Foreign Agricultural Service, USDA, was in Cairo, Egypt, Feb. 21-April 22, 1961, guarding the health of the animals on display in the U.S. pavilion of the Cairo International Agricultural Exhibition.

In his charge were 10 dairy cows procured in Egypt, and 3 beef animals, a half dozen sheep, and 300 layers carried over from the United States.

All the animals were vaccinated against serious animal diseases occurring in Egypt, and they remained healthy throughout the exhibition except for a few minor bruises.

The animals became well adapted to Egyptian conditions and feed under Dr. Konnerup's supervision. The layers were shipped over as day-old chicks and were raised in Egypt.

Dr. Nels Konnerup (right), Foreign Agricultural Service, USDA, is shown in Cairo, Egypt, explaining to 2 farmers the ways of protecting livestock from insects. Dr. Konnerup provided medical protection for the animals and poultry in the U.S. pavilion at the Cairo International Agricultural Exhibition.

The Egyptian dairy cows used in the exhibition had never been mechanically milked, but they yielded to this method without difficulty, and their production even increased, said Dr. Konnerup.

In addition to guarding the health of the livestock and poultry, the veterinarian helped man the area, explaining to viewers the development of livestock and poultry breeds, and directing the demonstration of the milking parlor.

Also, he took part in 2 agricultural seminars for the benefit of the staff of the Ministry of Agriculture of the United Arab Republic. Among other things, he discussed the organization and development of veterinary services in the United States.

The U.S. exhibit, portraying all the important phases of America's agricultural success story, was a joint undertaking of the USDA and the Office of International Trade Fairs of the U.S. Department of Commerce with the cooperation of private industry, the Land-Grant Colleges, and the State Department.

Dr. A. L. Stigers Assigned to Washington

Dr. Arthur L. Stigers (ISU '30), a USDA employee for 27 years, was recently named as veterinarian with USDA's Meat Grading Branch, Washington, D.C.

Dr. Arthur L. Stigers

The Branch is a unit of the Livestock Division, Agricultural Marketing Service. Dr. Stigers' work is primarily concerned with nonfederally inspected meat packing establishments, located in the eastern one third of the United States, which request and use the federal meat grading service.

After a period in private practice as a veterinarian, Dr. Stiger began his career with USDA in 1934 and was associated at that time with the Bureau of Animal Industry in tuberculosis eradication work in Arkansas and Mississippi.

Since 1936, except for a period in wartime service, he has served in various capacities with USDA's meat inspection service in the cities of Des Moines, Sioux City, Storm Lake, and Dubuque, Iowa, and in Denver, Colo.

From 1954 until this past January, when he received his present appointment, he served as inspector in charge of meat inspection at Dubuque.

Dr. Stigers is a member of the National Association of Federal Veterinarians and the Iowa State V.M.A.

Dr. W. M. Moulton Joins FAO in Turkey

The transfer of Dr. William M. Moulton (UP '43) to the Food and Agriculture Organization of the United Nations, Ankara, Turkey, was effective Dec. 29, 1960. He is on assignment as a technical assistant and has been appointed agricultural officer and veterinary laboratory officer. He will act as advisor for FAO to the government of Turkey on laboratory services within the veterinary field. Dr. Moulton transferred to FAO from the Animal Disease Eradication Division of USDA.

Dr. Moulton was in general practice in Vermont from 1943 to 1947. He entered federal service in 1947 with the former Bureau of Animal Industry, Tuberculosis Eradication Division, in Vermont as an area supervisor. He transferred to the Inspection and Quarantine Division in 1948 as a veterinary livestock inspector at the Canadian border, Derby Line, Vt., and remained there until 1949 when he was promoted to inspector in charge, Newport, Vt. He supervised border patrol activities in Minnesota and North Dakota in 1952 and 1953 during the Canadian foot-and-mouth disease epi-

Dr. William M. Moulton

zootic. During 1953 he was in Mexico as area supervisor on the foot-and-mouth disease campaign and was assistant administrative-technical co-director from 1954 to 1955. Later in 1955 he was on the Baltimore, Md., ADE staff and was trained as diagnostician in vesicular diseases. From 1956 to 1958, he served as assistant veterinarian in charge, Richmond, Va., and in 1958 was transferred to the Plum Island Animal Disease Laboratory to participate in studies with contagious bovine pleuropneumonia, sheeppox, Teschen's disease, rinderpest, foot-and-mouth disease, and vesicular exanthema. He remained there until he accepted the FAO assignment.

Dr. Moulton is the author of the publication "A Rapid Serological Test for Rinderpest." He is a member of the New York Academy of Sciences and the National Association of Federal Veterinarians.

Among the States and Provinces

Alabama

FIVE-STATE PUBLIC RELATIONS MEETING HELD.—Public relations representatives of veterinary medical associations of 5 southeastern states met in Montgomery, Ala., last March to discuss the possibilities of setting up an over-all public relations program for the area.

States represented at the meeting were Mississippi, Alabama, Georgia, Tennessee, and Florida.

The group will meet again at Auburn University in July.

Public relations representatives who attended the 5-state meeting are (seated, left to right): Drs. J. B. Duckworth (API '23), Mississippi; G. F. Yopp (AUB '53), Florida; T. C. Fitzgerald (OSU '28), Alabama; and S. R. Monroe (AUB '50), Alabama.

Standing are: Drs. John Morton (ISU '33), Georgia; Garrett Hagen, Jr. (AUB '59), Alabama; Mr. Gaines Hobbs, Tenessee; Mr. Jack Gilchrist, Georgia; Dr. W. R. Miller (AUB '50), Alabama; and Mr. L. B. Williams, Alabama.

Florida

VETERINARIAN APPOINTED TO GOVERNMENT POST.—Dr. Charles R. Forman (ISU '40), Fort Lauderdale, has been appointed to the Florida State Board of Control by Florida's Governor Farris Bryant.

The Board of Control supervises the state universities and the School for the Deaf and Blind.

Dr. Forman is serving his first term as a member of his county school board.

Indiana

FACULTY CHANGES AT PURDUE UNIVERSITY REPORTED.—Dean Erskine V. Morse (COR '44), School of Veterinary Science and Medicine at Purdue University, has announced 4 faculty changes within his school. The changes will become effective July 1, 1961.

Dr. John F. Bullard (COR '22), professor and head of the Department of Veterinary Clinics, has accepted the appointment as assistant dean of the School of Veterinary Science and Medicine and professor of surgery.

Dr. Bullard received an M.S. degree from Kansas State University in 1930. He conducted a mixed practice in New York State and was on the staff of the University of Kentucky before joining the faculty at Purdue in 1929. Dr. Bullard was made professor and head of the Department of Veterinary Clinics in 1959.

Dr. Harold E. Amstutz (OSU '45) has been appointed professor and head of the Department of Veterinary Clinics to succeed Dr. Bullard.

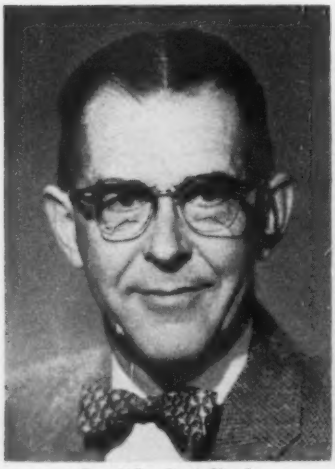
After serving in the Armed Forces and conducting a private practice for one year, Dr. Amstutz joined the faculty of Ohio State University in 1947. He was made chairman of the Department of Veterinary Medicine in 1955. Dr. Amstutz is a member of the AVMA and the Ohio V.M.A. He has contributed numerous scientific articles to professional journals.

Dr. John R. Annis (COL '50), associate professor of veterinary clinics, has been appointed assistant head of the Department of Veterinary Clinics.

After conducting a small animal practice in Denver, and spending 3 years at Cornell University, Dr. Annis joined the faculty of the School of Veterinary Science and Medicine at Purdue University in 1960. He is primarily responsible for the Small Animal Clinics.

Dr. Edward O. Haelterman (MSU '52), assistant dean of the School of Veterinary Science and Medicine and associate professor of veterinary microbiology, has resigned from his position as assistant dean and will continue in his capacity as associate professor of veterinary microbiology.

Dr. Haelterman joined the Purdue University staff in 1952. He received his M.S. degree from Purdue University in 1955 and his Ph.D. in 1959. He is particularly known for his work in gastroenteritis in swine. He



Dr. John F. Bullard

Dr. Harold E. Amstutz

Dr. John R. Annis

will devote most of his time after July 1 to research in this area.

Maine

MAINE V.M.A. MEETS.—At the business meeting of the Maine V.M.A. at Orono, April 12, the association voted against state association membership being a condition of AVMA membership.

The association also voted to contribute $100 to the state 4-H Club Livestock Show and approved the revision and printing of its bylaws.

Dr. E. C. Moore (ONT '37), secretary of the State Board, reported that the revised Maine State Practice Act is now being considered by the state legislature.

Missouri

UNIVERSITY OF MISSOURI TO HOLD SHORT COURSE.—The School of Veterinary Medicine, University of Missouri, is offering a short course on clinical bacteriology and parasitology. The course will be held on June 12-14 and will cover isolation and identification of organisms pathogenic to animals. A short review session on laboratory diagnosis of animal parasitisms will also be held.

The Department of Veterinary Bacteriology and Parasitology at the University is sponsoring the course. It will be taught by department faculty members—Drs. D. C. Blenden (MO '56), H. C. McDougle (MSU '46), E. L. McCune (MO '56), and G. C. Shelton (TEX '48).

North Carolina

HEROIC DOG RECEIVES PLAQUE FROM WESTERN CAROLINA V.M.A.—Snowball McCracken, a shepherd dog, was presented a plaque by the Western Carolina V.M.A. in appreciation of "loyalty and devotion for saving the life of his master February 24, 1961."

Mr. Harry McCracken, Snowball's master, had gone to his trench silo with a wheelbarrow to get silage for cattle on February 24. As he dug into the wall of silage, the entire wall fell over him, throwing him against the wheelbarrow. He broke his left leg in the fall and he was buried under the silage.

He tried to uncover his face and had just about given up when he felt Snowball digging down to him. Once his face was cleared, Snowball howled to draw attention.

Ohio

NEW DEPARTMENT CHAIRMAN NAMED AT UNIVERSITY.—Dr. Vernon L. Tharp (OSU '40) has been named chairman of the Department of Veterinary Medicine, Ohio State University. Dr. Tharp's appointment will become effective July 1.

He succeeds Dr. Harold E. Amstutz (OSU '45), who has resigned effective July 15 to assume a position at another university.

Dr. Tharp is currently a professor of veterinary medicine and director of the veterinary clinic. He will continue as clinic director with responsibility for the coordination and implementation of clinical teaching.

He has been a member of the Ohio State staff since 1942 when he was appointed an instructor in charge of the ambulatory clinic. In 1947 he was named assistant professor of veterinary medicine and made director of the entire veterinary clinic program. He became associate professor in 1951 and full professor in 1955.

Dr. Tharp's clinical teaching program has become widely known. He is an authority in the field of obstetrics and genital diseases and is the author of scientific reports and a contributor to the textbook, *Diseases of Cattle.*

Pennsylvania

PENNSYLVANIA V.M.A. SPONSORS SEMINAR.—The Pennsylvania V.M.A. sponsored a seminar on Mastitis Research in Pennsylvania at Harrisburg, April 13.

The seminar, the first of its kind to be sponsored by the association, was attended by 35 veterinarians. Dr. C. Donald Van Houweling (ISU '42), USDA Agricultural Research Service, Washington, D.C., acted as chairman.

The association hopes to sponsor similar seminars on various disease problems from time to time.

Subjects discussed at the seminar were basic mastitis research at the School of Vet-

Program participants look over report on mastitis research at Pennsylvania seminar. They are (left to right): Drs. James M. Murphy (UP '35), J. F. Hokanson (COR '43), William L. Henning, honorary member of the Pennsylvania V.M.A., and C. Donald Van Houweling (ISU '42).

erinary Medicine, University of Pennsylvania, mastitis program at the Pennsylvania State University, date of disappearance of antibiotics from milk of cows treated for mastitis, laboratory techniques for detection of antibiotics in milk, immunization of cattle against staphylococcic mastitis, and the Pennsylvania State University extension mastitis control program.

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PENNSYLVANIA V.M.A. GETS TELEPHONE DIRECTORY LISTINGS CHANGED.—Last fall it was noticed by veterinarians in Pennsylvania that the telephone company was no longer carrying the listing "veterinary hospitals," but in its place was listing "animal hospitals."

The veterinarians, feeling this was an infraction of veterinary ethics, took the matter to the state association meeting for consideration.

The Pennsylvania V.M.A. House of Delegates voted that the telephone company be contacted and urged to change the listing back to "veterinary hospitals."

Dr. Raymond C. Snyder (UP '33), secretary of the association, reports that the telephone company has advised him that, starting in June, telephone directories for the eastern part of the state will carry the proper listing. As new directories throughout the state are published, the change will be made.

Dr. Snyder points out that the progress made by the Pennsylvania V.M.A. in correcting the directory listing is one example of the way "organized veterinary medicine serves the individual doctor."

Washington

WASHINGTON STATE UNIVERSITY RECEIVES GRANT.—The College of Veterinary Medicine, Department of Veterinary Microbiology, of Washington State University has received a National Institute of Health training grant.

The grant will support 2 programs of training—one a graduate program leading to M.S. and Ph.D. degrees, the other a residency program in veterinary microbiology.

Inquiries and requests for application forms should be sent to: Training Program Director, Department of Veterinary Microbiology, College of Veterinary Medicine, Washington State University, Pullman, Wash.

Wisconsin

NORTHWESTERN WISCONSIN V.M.A. MEETS.—Mastitis was the topic of a panel discussion held at the semiannual meeting of the Northeastern Wisconsin V.M.A. in Appleton, April 19, 1961.

Moderating the panel was Dr. Karl B. Hammerberg (ONT '10), New London. Others on the panel were: Drs. John C. Dahl (MIN '56), Clintonville; Miles Agee (KSU '50), Chilton; Edwin K. Prather

(KSU '52), Manawa; and Raymond O. Hill (KSU '51), West DePere.

The association's next meeting will be held Sept. 20, 1961, in Green Bay, Wis.

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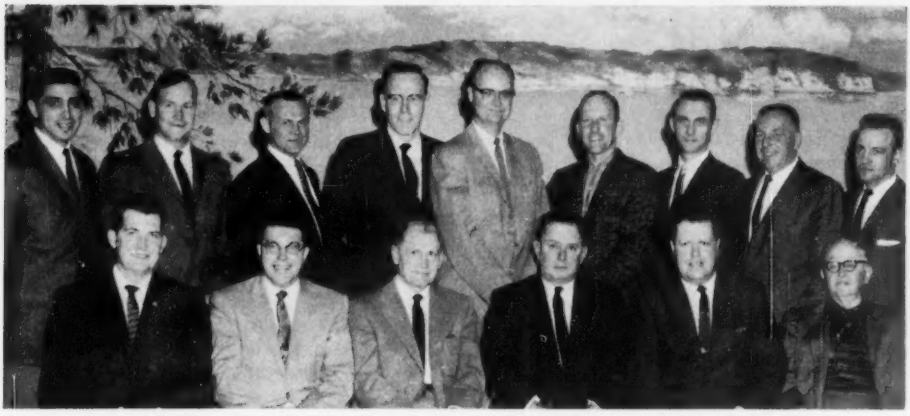

Wisconsin V.M.A. executive board and guests are shown at a recent meeting at the Wisconsin Dells. Present were (seated left to right): Drs. Dale Kelley (ISU '51), Sauk City, delegate to AVMA; E. P. Pope (ISU '49), Madison, treasurer; E. A. Woelffer (COR '31), Oconomowoc, president; Sam Elmer (OSU '34), Richland Center, president-elect; Willis Lyle (OSU '44), Deerfield, president, executive board; B. A. Beach (OSU '09), Verona, counselor. Standing (left to right) are: Drs. Charles Gurneau (MSU '50), Milwaukee, District I; E. K. Prather (KSU '52), Manawa, program chairman; Clifford Orton (ISU '42), Beaver Dam, District IV; W. J. O'Rourke (MSU '44), Madison, executive secretary; Arden Erdmann (OSU '43), Madison, state-federal veterinarian; Burr Nussdorfer (OSU '46), Sparta, past-president; Roger Tetzlaff (ISU '52), Morrissonville, District V; Al Geffert (ONT '36), Reedsburg, District VII; and William Burmeister (MSU '51), Pulaski, District V

Veterinary Military News

Army Veterinary Corps Observes 45th Anniversary

The U.S. Army Veterinary Corps celebrated its 45th anniversary on June 3.

"These 45 years of steady progress in fields of food inspection, training, and research have been a vital aid to the Army Medical Service in maintaining the health of the soldier," observed Brigadier General Russell McNellis, V.C., chief of the Corps and assistant for veterinary services to the Army Surgeon General.

"The present-day Army Veterinary Corps has assumed an increasingly prominent role in improving health conditions throughout the world," General McNellis added. "We have encouraged friendly nations to consult us for technical assistance and advice, especially in the field of prevention and control of diseases among animals."

Established in 1916 to inspect foods procured for military consumption and to provide medical care for military animals, the Corps during the past 4 decades has been of great benefit to both the military and civilian communities.

The Corps consists of commissioned officers who are graduate veterinarians of

approved colleges of the United States and Canada. It is supported by enlisted members of the Army Medical Service, principally on its food inspection teams.

With the complete mechanization of the Army, the only military animals that the Corps cares for nowadays are the scout and sentry dogs. In addition, veterinary officers are charged with procuring, breeding, and caring for the many types of animals used in medical research.

The veterinarian's knowledge of the diseases, anatomy, and physiology of the different species of animals equips him for the many activities involving animal medicine.

Members of the Corps also conduct research directed toward defense against radiologic, chemical, and biological agents and other emerging aspects of modern warfare. They perform chemical and bacteriologic analyses of foods, and assist in research involving biomedical problems. Some serve with research groups investigating medical problems of flight; and, since animals of various species are utilized in these experiments, the veterinarian's professional competence is invaluable.

Army veterinarians have been included in most scientific groups for the nuclear weapons test series conducted in Nevada and the Pacific. They have participated as instructors and staff members of the Oak Ridge Institute of Nuclear Studies for courses in veterinary radiologic health. They were on the army missile team that put the first monkeys (Able and Baker) into space and were also on the team that fired a project Mercury-Redstone missile into space with a capsule containing the now-famous chimpanzee "Ham."

Army veterinarians assist allied governments in animal disease programs, and others are assigned to military missions in various countries. Members of the Corps also conduct courses of instruction and train veterinary officers of allied armies throughout the world.

Medical officers are relieved of many environmental health problems by veterinarians who function as essential components of preventive medicine units and programs. They likewise conduct continuous research on animal diseases transmissible to man, including such diseases as are peculiar to foreign countries.

A Registry of Veterinary Pathology was established at the Armed Forces Institute of Pathology and has been operated there continuously since 1944 by assigned veterinary scientists.

This registry, which includes specimens collected from all over the world, is internationally recognized as the only activity of its kind. Medical scientists throughout the United States and many allied countries use this facility in connection with research on human and animal diseases.

Among the Corps' achievements over the years was the development of tuberculosis-free dairy herds and establishment of a sanitary milk supply in Eritrea, North Africa. It has established similar programs to insure a safe, fresh milk supply for our troops stationed in Europe.

Veterinary officers have developed a vaccine for prevention of rinderpest, and also a sonic-vibrated leptospiral antigen for the serologic diagnosis of leptospirosis. They have demonstrated how equine encephalomyelitis is transmitted to man and have determined the value and safety of tetanus toxoid in animals prior to its use for man. They have established a leptospirosis research and diagnostic center providing service to the 3 military departments and the Veterans Administration. This center functions as a Pan-American reference laboratory for the World Health Organization.

A look to the future of the Army Veterinary Corps promises challenging opportunities for veterinarians in all phases of their profession.

State Board Examinations

FLORIDA—June 15-17, 1961, Biscayne Terrace Hotel, Miami, Fla. Dr. E. F. Thomas, Secretary, 4937 S. Tamiami Trail, Sarasota, Fla.

GEORGIA—June 15-16, 1961. Atlanta, Ga., Dr. A. M. Mills, Secretary, 325 Pinecrest Dr., Athens, Ga.

MASSACHUSETTS—June 19-21, 1961, University of Massachusetts, Amherst. Applications must be filed by June 1, 1961. Dr. Edward A. Zullo, Secretary, Room 33, State House, Boston 33, Mass.

NEVADA—June 21-23, 1961, State Department of Agriculture Building, 350 Capitol Hill Ave., Reno, Nev. Fee $100. Dr. John L. O'Harra, Secretary-Treasurer, P.O. Box 1209, 350 Capitol Hill Ave., Reno, Nev.

NORTH CAROLINA—June 21-23, 1961, Morehead-Bilt-

more Hotel, Morehead City, N.C. Dr. James I. Cornwell, secretary, P.O. Box 9038, Asheville, N.C.

SOUTH CAROLINA—June 15-16, 1961, Columbia Hotel, Columbia, S. Car. Dr. H. L. Sutherland, Secretary-Treasurer, Union, S. Car.

UTAH—June—29, 1961, Department of Business Regulation and Registration, State Capitol Building, Salt Lake City, Utah, 9 a.m. Applications must be filed by June 15, 1961. Fee $15. Dr. Frank Lees, Director of the Office of Business Regulation and Registration, State Capitol Building, Salt Lake City, Utah.

WEST VIRGINIA—June 19, 1961, Capitol Building, Room 117, Charleston W. Va. Dr. H. J. Fallon, Secretary, 200 Fifth St., W., Huntington, W. Va.

WISCONSIN—June 26-27, 1961, Madison, Wis. Dr. A. A. Erdmann, Secretary, 6 W. State Capitol, Madison 2, Wis.

Deaths

Star indicates member of AVMA

★**Hugh F. J. Arundel** (CIN '19), 67, of Statesboro, Ga., died Feb. 27, 1961.

Dr. Arundel was a general practitioner.

Charles S. Babcock (CVC '15), 70, Palatine, Ill., died March 29, 1961.

Dr. Babcock was a general practitioner.

H. B. Bartholow (GR '04), 77, Fairmont, W. Va., died April 8, 1961.

Dr. Bartholow had served Marion County, W. Va., for more than 50 years.

Scott B. Brown (WSU '16), 75, Boise, Idaho, died April 8, 1961.

Dr. Brown was at one time Idaho state veterinarian. He also served as deputy state veterinarian and inspector in charge of the Idaho sheep commission.

Dillard O. Browning (API '12), 76, retired head government meat inspector at the Reelfoot Packing Co., Union City, Tenn., died March 16, 1961. Dr. Browning retired in 1954.

Scott A. Burnam (COL '25), 68, Kerrville, Texas, died in April, 1961.

Dr. Burnam, formerly of Fort Worth, was a government meat inspector for 15 years. He retired in 1951.

Marion F. Curtis, 77, of McCaskill, Ark., died March 27, 1961.

Dr. Curtis was retired.

★**George E. Failing** (GR '12), 74, of Tampa, Fla., died April 7, 1961.

Dr. Failing had maintained a general practice in Oxford, Mich., until 2 years ago when he moved to Tampa. He was awarded a life membership in the AVMA in 1954.

John R. Hasson, Sr. (KCV '18), 72, died March 23, 1961, after a heart attack.

Dr. Hasson had practiced in Mulberry, Kan., for about 50 years. He was a member of the Southeast Kansas and the Kansas State V.M.A.'s. His 2 sons, Drs. David S. (ONT '34) and John R. (ONT '37), are also veterinarians.

★**Guy P. Hatchett** (IND '22), 72, of Chatanooga, Tenn., died April 5, 1961.

Dr. Hatchett, who had been named veterinarian of the year by the Tennessee V.M.A. last January, was a past president of the Tennessee State V.M.A. and of his local V.M.A. For the past 16 years he had been in practice with his son, Dr. G. P. Hatchett, Jr. (AUB '45).

★**Claude M. McFarland, Sr.** (KCV '00), 61, of Kansas City, Kan., died April 8, 1961.

Dr. McFarland was on the AVMA Honor Roll.

Harry K. McIntosh (IND '17), 70, Hudson, Ind., died of a heart attack March 29, 1961.

Dr. McIntosh was formerly employed at the Union Stockyards in Chicago, Ill.

Orval H. Meinecke (KSU '42), 43, of Hot Springs, Ark., died April 11, 1961.

Dr. Meinecke was a past president of the Arkansas V.M.A. and was selected as the association's veterinarian of the year, 1960.

James E. Nesbitt (ONT '20), died of a heart attack March 9, 1961.

Dr. Nesbitt was retired. He was formerly an employee of the Ontario Department of Agriculture.

C. H. Noffsinger (ARK '16), 91, of De Queen, Ark., died March 31, 1961.

Dr. Noffsinger was a member of the Arkansas V.M.A. He had lived in De Queen for the past 45 years.

★A. V. Schwartz Jr. (KSU '38), 45, Salina, Kans., died of a heart attack March 3, 1961.

Dr. Schwartz had operated an animal clinic in Salina for the past 15 years. He was the immediate past president of the Kansas V.M.A.

★Richard N. Shaw (COR '12), 71, a general practitioner of Shrewsbury, Mass., died March 27, 1961.

Dr. Shaw held a life membership in the Massachusetts V.M.A. He became a life member of the AVMA in 1960.

Frank L. Skrable (CVC '04), 79, Sioux City, Iowa, died of a heart attack April 12, 1961.

Dr. Skrable was employed by the USDA as a meat inspector for more than 30 years.

Jacob G. Weiler (CVC '15), 74, Burlington, Wis., died March 9, 1961.

Dr. Weiler was a general practioner in Burlington for more than 45 years.

Robert L. Wilson, 77, of Statesville, N. Car., died of a heart attack April 1, 1961.

Women's Auxiliary

Kansas

KANSAS WOMEN'S AUXILIARY MEETS.—The Women's Auxiliary to the Kansas V.M.A. held their annual meeting in Wichita, Kan., Jan. 15-17, 1961.

Officers installed at the meeting are: Mrs. A. V. Schwartz, Salina, president; Mrs. Dallas Nelson, Manhattan, president-elect; and Mrs. Gordon T. Jamieson, Wichita, secretary-treasurer.

Mrs. E. E. Leasure, president of the Women's Auxiliary to the AVMA, spoke at the luncheon session of the meeting.

Ohio

WOMEN'S AUXILIARY ELECTS NEW OFFICERS.—New officers of the Women's Auxiliary to the Ohio State V.M.A. elected at their recent meeting in Toledo are: Mrs. Robert H. Custis, New Vienna, president; Mrs. P. B. Johnston, Cincinnati, president-elect; Mrs. Benjamin S. Henson, Mansfield, secretary, and Mrs. C. Roger Smith, Columbus, treasurer.

New York

Officers of the Women's Auxiliary to the New York State Veterinary Medical Society for 1961 are (left to right): Mrs. Donald McKown, Franklin, president-elect; Mrs. Myron Fincher, Ithaca, membership chairman; Mrs. Thomas J. Love, Watkins Glen, president; Mrs. Henry E. Grossman, Great Neck, treasurer; and Mrs. DuBois Jenkins, Catskill, secretary.

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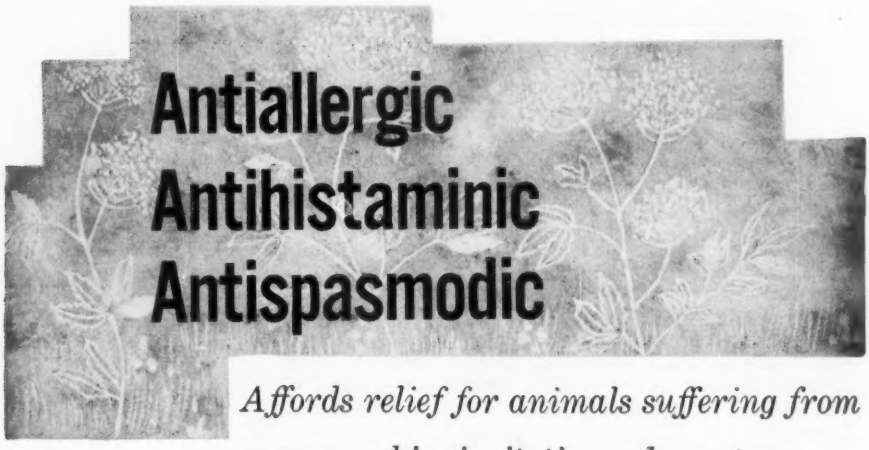

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REFERENCES: 1. Roe, C. K.: Enteric Infections in Weaned Pigs. Paper presented at the Second Regional Conference on the Nitrofurans in Veterinary Medicine, Madison, Wisconsin, May 28, 1959, p. 10. 2. Hughes, D. L., and McMinn, Jr., C. S.: Furacin—A Control for Gray Droppings. Am. Fur Breeder 32:24 (Aug.) 1959. 3. Palarski, J. D.: Furacin Treatment of Gray Diarrhea in Mink. J. Am. Vet. M. Ass. 136:177 (Feb. 15) 1960. 4. Johnson, C. A.: Studies on the Efficacy of Soluble Furacin Against Cecal Coccidiosis. Abstracts of papers presented at the 45th Annual Meeting of the Poultry Science Association, Raleigh, N. C., Aug. 7-10, 1956, p. 21. 5. Shumard, R. F.: The Activity of Soluble Furacin Against the Coccidian, Eimeria necatrix. Paper presented at the First National Symposium on Nitrofurans in Agriculture, Michigan State University, East Lansing, Michigan, Sept. 28-29, 1956.

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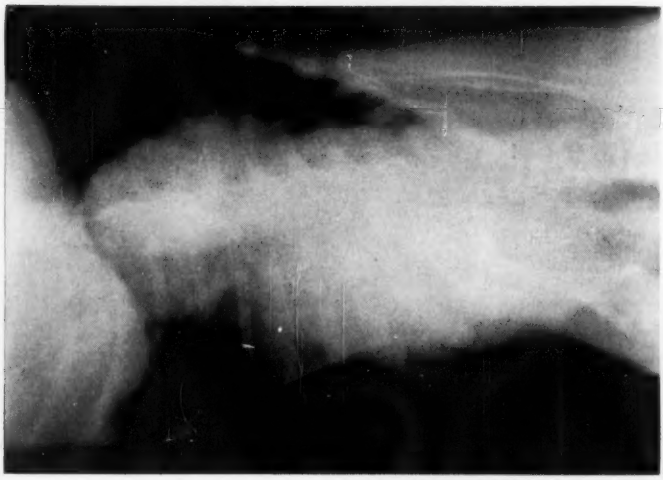

Fig. 1—Ventrodorsal radiograph of the thorax of a female Collie, 15 years old.

Fig. 2—Right lateral radiograph of the Collie.

History.—A spayed female Collie, 15 years old, was admitted to the clinic with a history of marked weight loss during the previous 2 months. Although her appetite had been normal, she frequently vomited a white, foamy liquid. Her body temperature on admission was 103 F. The total leukocyte count was 42,700/cmm. The differential count was: segmented neutrophils 77%, nonsegmented neutrophils 13%, lymphocytes 4%, monocytes 5%, and eosinophils 1%. There were numerous nucleated erythrocytes with evidence of polychromatophilia and Howell-Jolly bodies. A radiographic examination of the thorax was performed (fig. 1, 2).

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Thoracic neoplasm infiltrating the sternum.

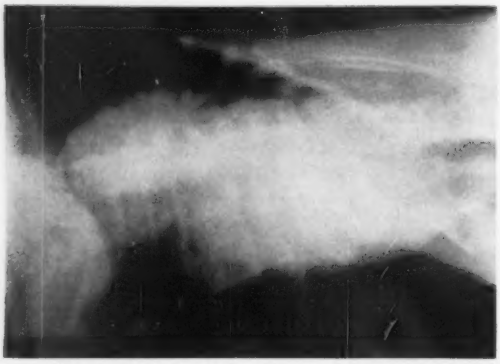

Fig. 3—A large homogeneous mass occupies most of the left anterior portion of the dog's thoracic cavity. The heart is displaced to the right.

Comments.—A large homogeneous mass with fairly distinct margins occupied most of the left anterior portion of the thoracic cavity. There was marked destruction of the anterior portion of the sternum (fig. 4). The cardiac silhouette was displaced to the right (fig. 3). These changes are diagnostic of a neoplastic mass within the thoracic cavity that has invaded portions of the sternum.

At necropsy a large neoplastic mass approximately 5 by 5 by 4 inches was found adhered to the left thoracic wall and invading the anterior portion of the sternum. The neoplasm was lobulated and did not involve the lungs. On sectioning, the neoplasm was soft and deep red. On histopathologic examination, it was found to be malignant, with blood sinuses and capillaries present, and a specific diagnosis of hemangiosarcoma was made. There was no evidence of metastasis.

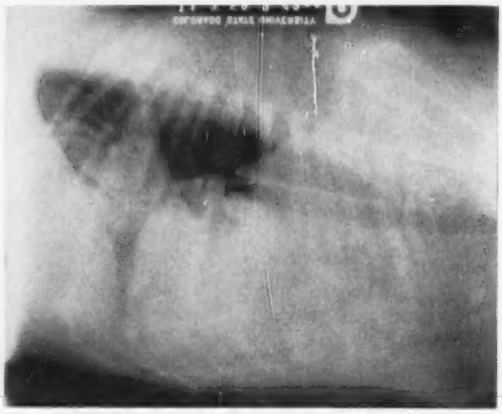

Fig. 4—There is marked destruction of the anterior portion of the sternum.

This report was submitted by Joe P. Morgan, D.V.M., assistant radiologist, and William D. Carlson, D.V.M., Ph.D., radiologist, College of Veterinary Medicine, Colorado State University, Fort Collins.

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REFERENCES: Teigland, M. B.: Proceedings of the 4th Annual Meeting, Amer. Assn. of Equine Pract., Chicago, Illinois, 1959. Witter, R. S.: Paper read at the Third Regional Conference on the Nitrofurans in Veterinary Medicine, Atlanta, Georgia, January 14, 1960.

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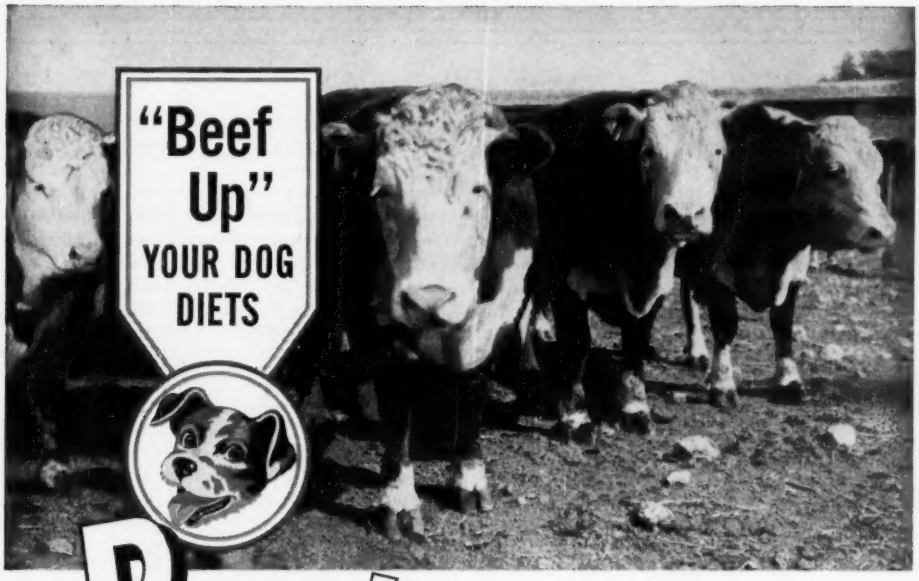

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History of the AVMA

1912

At the 1912 meeting in Indianapolis, President Samuel Brenton acknowledged some discontent with the system of nominating officers by a committee composed of past presidents. "Our Association had a period when an unseemly struggle for official places, both elective and appointive, characterized our annual meeting . . . . Many of the newer members . . . do not realize the beneficent influence of the present plan of nomination."

The section on sanitary science featured a symposium on hog cholera; that on medicine, a symposium on glanders, which included reports by R. S. McKellar, K. F. Meyer, and C. J. Marshall. As something of a new departure, the 3 sessions of the section on surgery were devoted to the clinic at the Indiana Veterinary College. The roaring operation was of paramount importance, with performances by W. L. Williams, J. N. Frost, L. A. Merillat, J. W. Adams, and J. H. Blattenberg. In a paper on "The Surgical Relief of Roaring," Drs. Williams and Frost reported their work aimed at denudation of the lateral ventricles of the larynx, using the burr devised by Dr. Blattenberg—with poor results until Frost hit upon the "trivial" idea of adding wisps of cotton.

It was decided to appoint a committee to assist the editors of farm journals ". . . to purge their advertising columns of fake and misleading advertisements concerning proprietary preparations put out for the use of veterinarians and the public." While this committee was to act only upon request of a journal, the resolution creating it was adopted only after strong protests that failure to condemn an advertisement for an article of possibly doubtful merit would automatically constitute an endorsement of that product. Nelson S. Mayo, who had championed the proposal, was made chairman of the committee, along with C. A. Cary and S. B. Nelson. The following year they reported considerable progress, notably in having advertising for the London (Ontario) Veterinary Correspondence School completely eliminated from all periodicals. Some journals, as the *Progressive Farmer*, edited by Tait Butler, eliminated all questionable advertising at a considerable cost in loss of revenue. But "others, and among them some of the most influential papers of the continent, paid no attention to our letters."

John R. Mohler was elected president; C. J. Marshall and G. R. White were re-elected secretary and treasurer, respectively.

JOHN ROBBINS MOHLER was born May 9, 1875, and was educated in Philadelphia. He received an M.A. from Temple University in 1893 and a V.M.D. from the University of Pennsylvania in 1896. Later he did advanced work at Marquette University and at Alfort. In 1897 he entered the Bureau of Animal Industry as a field inspector in the Quarantine Division. Later he was transferred to the Meat Inspection Division, and in 1899 to the Pathological Division, becoming its chief in 1902. In 1914 he became assistant chief of the BAI, and chief in 1917 upon the death of A. D. Melvin.

By the time he was elevated to chief of the Bureau, Dr. Mohler had already authored, coauthored, or translated some 5,000 pages of veterinary literature. He had been vice-president of the U. S. Livestock Sanitary Association (1910), a member of the International Tuberculosis Commission (1910), and vice-president (1911-12) and president (1912-13) of the AVMA, among numerous other activities. At 37, he had been the youngest AVMA president since 1900; the 12 men preceding him averaged more than 50 years of age at the time of election. In 1915 it was said of him: "He has been found fit in all the trials of high public office . . . and, as he rose in favor, at every step has merited his promotions by scientific activity and productiveness."

In 1939 he was awarded the Twelfth International Veterinary Congress prize and, in 1943, upon his retirement as chief of the BAI, he became the first recipient of the AVMA award. His death on Feb. 28, 1952, terminated one of the most productive careers in the history of veterinary medicine.

John R. Mohler, AVMA president from 1912 to 1913

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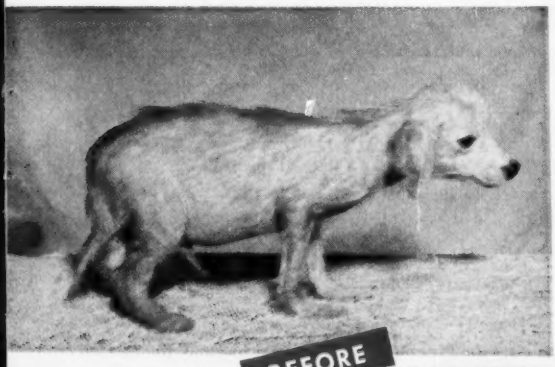

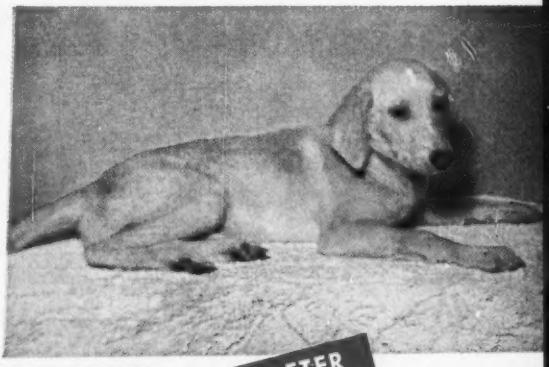

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1. "Clinical Evaluation of a Drug for Dermatoses of Dogs and Cats," Wenger, J. B., Vet. Med., 55:55-58, Mar. 1960.

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American Journal of Veterinary Research

Volume XXII July, 1961 Number 89

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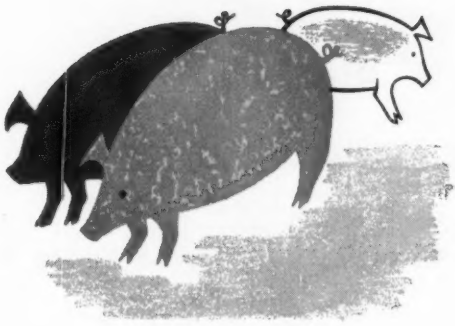

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Public Relations

Membership Services

Records Department Keeps Tabs on all Veterinarians

"How do we improve the communication between the AVMA and its members?" is a question facing any member of the staff. For some, the question involves a study of the channels of communication from the office to the membership. Other staff members examine syntax, style, printing, color, and other components of effective written communication. For this member, the study involved is as mundane, and as basic, as a survey of AVMA records-keeping functions.

The nerve center for most communications between the AVMA and more than 23,000 veterinarians throughout the world is housed in a gray steel cabinet full of cards which are punched with cryptic, rectangular holes.

Members of the AVMA Records Department, Mrs. Anita Riege, Miss Carrie Kish, and Mrs. Kay Van Quelef, keep the vital statistics of each AVMA member.

To the uninitiated, each of these cards looks much like every other. Some are salmon, some are green, some are white—all are unintelligible except for a small amount of information printed in "human" language across the top of each card. To those whose job it is to work with them daily, however, each card is a unique personality. Each punch is an identifying characteristic.

Suppose a question arises which centers around an otherwise unknown Dr. Doe. A brief reference to 2 IBM cards supplies the following hypothetical information:

"Dr. John C. Doe, who resides at 2340 Morningside Dr. in Topeka, Kan., is an active member of the AVMA and has paid his 1961 dues. He receives both the JOURNAL and the *American Journal of Veterinary Research* as a membership service. He is 32 years old, was born Aug. 3, 1928, in Colorado. He engages in clinical practice in his major specialty as a bovine practitioner. He has a partner.

Dr. Doe received his veterinary degree from the School of Veterinary Medicine, University of Illinois in 1954 and joined the AVMA in that year. He is a veteran and a member of the Armed Forces Reserves. He is not a participant in the AVMA Group Insurance; however, he does carry AVMA Professional Liability Insurance. Since joining the AVMA he has consistently paid his dues with the exception of 1957 when he dropped his membership. Upon application, however, he was reinstated the following year."

(*Continued on adv. p. 36*)

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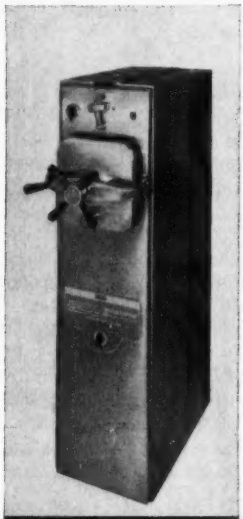

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PR Page — *continued*
from adv. p. 34

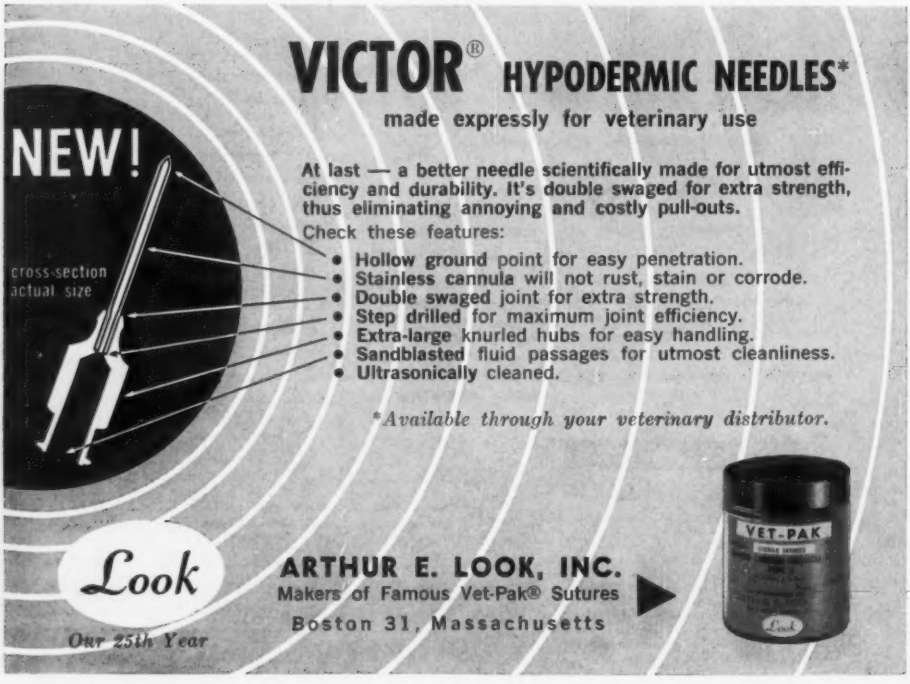
Every veterinarian has, or should have, similar information on file at the AVMA. The job of maintaining these files is a complex one and absorbs the undivided attention of several employees who keep track of dues payments, address changes, graduations, deaths, and other vital statistics.

The punched cards are not idle repositories of facts; they provide the working documents for compiling statistical reports, addressing copies of the JOURNAL and *A.J.V.R.* and preparing dues notices and membership cards. In fact most routine recording and addressing functions have been automated to provide fast, economical processing. The punched card allows the AVMA to address each individual as a part of a group, or single him out for special attention.

Presently, the processing of the punched cards is done by an outside agency which maintains the high-speed equipment necessary to interpret and process the cards. Data processing requirements have grown considerably over the past few years, and the AVMA now finds itself in a position to lease and maintain its own machinery for processing the cards economically.

Present personnel of the records department are being trained to operate the new "hardware" which will arrive in September. When it is delivered, the first assignment will be to prepare the copy for the 1962 *AVMA Directory*. Thereafter, the AVMA will do all the routine data processing jobs in its own office using AVMA employees. The results, we hope, will be better control and more efficient operations resulting in more and better communications between the office and the members.

R. D. MORRISON
Administrative Assistant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Coming Meetings

Notices of coming meetings must be received 30 days before date of publication.

June, 1961

South Carolina Veterinary Medical Association. Summer program. Columbia Hotel, Columbia, S.C., June 15-17, 1961. Dr. L. D. Rodgers, Greenwood Veterinary Hospital, Box 348, Greenwood, S.C., program chairman.

Montana Veterinary Medical Association. Annual meeting. The Meadow Lark Country Club, Great Falls, Mont., June 16-18, 1961. Dr. G. A. Morrison, 316 Central Ave., W., Great Falls, Mont., secretary.

Wyoming Veterinary Medical Association. Annual meeting. Powell, Wyo., June 18-20, 1961. Dr. J. F. Ryff, P.O. Box 960, Laramie, Wyo., secretary.

Georgia Veterinary Medical Association. Fifty-fifth annual convention. Jekyll Island, Ga., June 18-20, 1961. Dr. A. M. Mills, 325 Pinecrest Dr., Athens, Ga., secretary.

North Dakota State Veterinary Medical Association. Fifty-sixth annual meeting. Ray Hotel, Dickinson, N.D., June 18-20, 1961. Dr. C. B. Bjornson, North Dakota State University, Fargo, N.D., secretary-treasurer.

North Carolina Veterinary Medical Association. Sixtieth annual meeting. Morehead-Biltmore Hotel, Morehead City, N.C., June 19-21, 1961. Dr. J. T. Dixon, 3026 S. Main St., Winston-Salem, N.C., secretary.

Iowa State University. Annual conference for veterinarians. Memorial Union, Ames, Iowa, June 20-21, 1961. C. D. Lee, Iowa State University, School of Veterinary Medicine, Ames, Iowa, committee member

Massachusetts Veterinary Association. Summer meeting. University of Massachusetts, Amherst, June 21, 1961. Mr. L. T. Maloney, 6 Beacon St., Boston 8, Mass., consultant.

Minnesota Veterinary Medical Association and South Central Minnesota Veterinary Medical Association. Summer clinic. Owatonna, Minn., June 21, 1961. Dr. Paul Cox, 1005 Mineral Springs Rd., Owatonna, Minn., general chairman.

Maryland State Veterinary Medical Association. Annual meeting. Ocean City, Md., June 22-23, 1961. Dr. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore 14, Md., secretary.

Idaho Veterinary Medical Association. Annual meeting. Flamingo Motel, Idaho Falls, June 22-24, 1961. Dr. A. P. Schneider, Room 206, Statehouse, Boise, Idaho, secretary.

Saskatchewan Veterinary Medical Association. Annual meeting. Saskatchewan Hotel, Regina, June 23-24, 1961. Dr. W. Turnbull, Department of Health. Saskatoon, Sask., secretary-treasurer.

Utah Veterinary Medical Association. Annual meeting. Utah State University, Logan, Utah, June 26-27, 1961. Dr. J. A. Thomas, Box 592, Provo, Utah, secretary.

Maritime Veterinary Associations. Twelfth annual joint conference. Mount Allison University, Sackville, N.B., June 27-29, 1961. Dr. R. McG. Archibald, P. O. Box 310, Sackville, N.B., Can.

Nebraska, University of. Swine Repopulation Conference. Veterinary Science Department, University of Nebraska, Lincoln, Neb., June 28-29, 1961. Dr. Crosby Howe, Department of Veterinary Science, University of Nebraska, Agricultural Experiment Station, Lincoln 3, Neb., chairman.

Michigan Veterinary Medical Association. 79th annual convention. Grand Hotel, Mackinac Island, Mich., June 29-July 1, 1961. Mr. Victor Hurwitz, 815 Donovan Bldg., Detroit 1, Mich., public relations counsel.

July, 1961

Mississippi-Louisiana Veterinary Medical Associations. Bi-state annual meeting. Buena Vista Hotel, Biloxi, Miss., July 2-4, 1961. Dr. J. W. Branson, Box 4223, Fondren Station, Jackson, Miss., secretary; or Dr. R. B. Lank, 246 Guava Dr., Baton Rouge, La., executive secretary.

Nebraska Veterinary Medical Association. Annual summer and clinical demonstration meeting. Town House, Omaha, Neb., July 10-12, 1961. Mr. Bob Garey, Hotel Clarke, Rooms 18-419, Hastings, Neb., executive secretary.

Arkansas Veterinary Practitioners Association. Aronelle Motel, Hot Springs, Ark., July 16-18, 1961. Dr. James B. Roberts, Booneville, Ark., secretary.

Kentucky Veterinary Medical Association. Fiftieth annual meeting. Sheraton Hotel, Louisville, Ky., July 17-18, 1961. Dr. L. S. Shirrell, 545 E. Main St., Frankfort, Ky., secretary.

Auburn University. Fifty-fourth annual conference for veterinarians. Auburn University, School of Veterinary Medicine, Auburn, Ala., July 25-26, 1961. Dr. J. E. Greene, dean.

August, 1961

International Association of Milk and Food Sanitarians. Golden anniversary meeting. Wanderer Resort Motel, Jekyll Island, Ga., Aug. 14-17, 1961. T. L. Jones, Room 512, 1145 Nineteenth St., N.W., Washington 6, D.C.

American Association of Veterinary Bacteriologists. Annual meeting. Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Aug. 18-19, 1961. C. H. Cunningham, Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, secretary.

American Veterinary Medical Association. Ninety-eighth annual meeting. Sheraton-Cadillac Hotel, Detroit, Mich., Aug. 20-24, 1961. Dr. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Electron Microscope Society of America. 19th annual meeting. Pittsburgh Hilton Hotel, Pittsburgh, Pa., Aug. 23-26, 1961. Dr. A. R. Taylor, Research Division, Parke, Davis and Co., Detroit 32, Mich., program chairman.

International Association of Microbiological Societies. Seventh International Congress of the Permanent Section on Biological Standardization. London, England, Aug. 28 to Sept. 1, 1961. E. C. Hulse, Ministry of Agriculture, Central Veterinary Laboratory, Weybridge, Surrey, secretary of organizing committee.

September, 1961

Animal Care Panel. 12th annual meeting. Statler Hilton Hotel, Boston, Mass., Sept. 27-29, 1961. Dr. Bernard F. Trum, Sherborn, Mass., general chairman.

Oregon Veterinary Medical Association. Fall clinic meeting. Corvallis, Ore., Sept. 28-30, 1961. Dr. K. J. Peterson, Office of the Secretary, Poultry-Veterinary Building, Corvallis, Ore., program chairman.

October, 1961

New England Veterinary Medical Association. Annual meeting. Poland Springs Hotel, Poland Springs, Maine, Oct. 1-4, 1961. Dr. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass., secretary.

Symposium on Recent Developments in Research Methods and Instrumentation. 11th annual instrument symposium and research equipment exhibit. National Institutes of Health, Bethesda 14, Md., Oct. 9-12, 1961. Mr. James B. Davis, National Institutes of Health, Bethesda 14, Md., executive secretary.

Eastern Iowa Veterinary Association. Annual meeting. Sheraton Montrose Hotel, Cedar Rapids, Iowa, Oct. 12-13, 1961. Dr. William R. Goodwin, Newhall, Iowa, secretary.

Illinois Veterinary Medical Conference and Short Course. University of Illinois, Urbana, Oct. 19-20, 1961. Dean C. A. Brandly, College of Veterinary Medicine, University of Illinois, Urbana, Ill.

Gaines Symposium. University of Illinois, Urbana, Ill., Oct. 20, 1961. Mr. Harry Miller, Gaines Dog Research Center, 250 Park Ave., New York 17, N.Y., director of the Dog Research Center.

Midwest Feed Manufacturers' Association. Centennial Nutrition conference, Kansas City, Mo., Oct. 21-25, 1961. Fennell-Gibson Public Relations, 2201 Grand Ave., Kansas City, Mo.

California Veterinary Medical Association. Annual meeting. Long Beach, Calif., Oct. 23-25, 1961. Mr. Kenneth Humphreys, 3004 Sixteenth St., Rooms 301-303, San Francisco 3, Calif., executive secretary.

Missouri, University of. 37th annual veterinary conference. Columbia, Mo., Oct. 30-31, 1961. Dr. Cecil Elder, Department of Veterinary Pathology, School of Veterinary Medicine, University of Missouri, Columbia, Mo., chairman.

National Association of Federal Veterinarians. Annual meeting. Curtis Hotel, Minneapolis, Minn., Oct. 31, 1961. Dr. F. L. Herchenroeder, Box 3085, Parkfairfax Station, Alexandria, Va., secretary.

Foreign Meetings

Fourth International Congress on Animal Reproduction. The Hague, Netherlands, June 5-9, 1961. For additional information contact: the Secretariat of the Fourth International Congress on Animal Reproduction, 14, Burgemeester de Monchyplein, The Hague, Netherlands, Dr. L. Hoedemaker, secretary to the organizing committee.

Eighth International Congress of Animal Husbandry. Hamburg, Germany, June 13, 1961.

7th International Congress of Biological Standardization. Permanent Section of Biological Standardization of the International Association of Microbiological Societies. Wellcome Foundation Ltd., the Wellcome Building, Euston Rd., London N.W. 1, England. E. C. Hulsa, Ministry of Agriculture, Central Veterinary Laboratory, Weybridge, Surrey, secretary of organizing committee, Aug. 28-Sept. 1, 1961.

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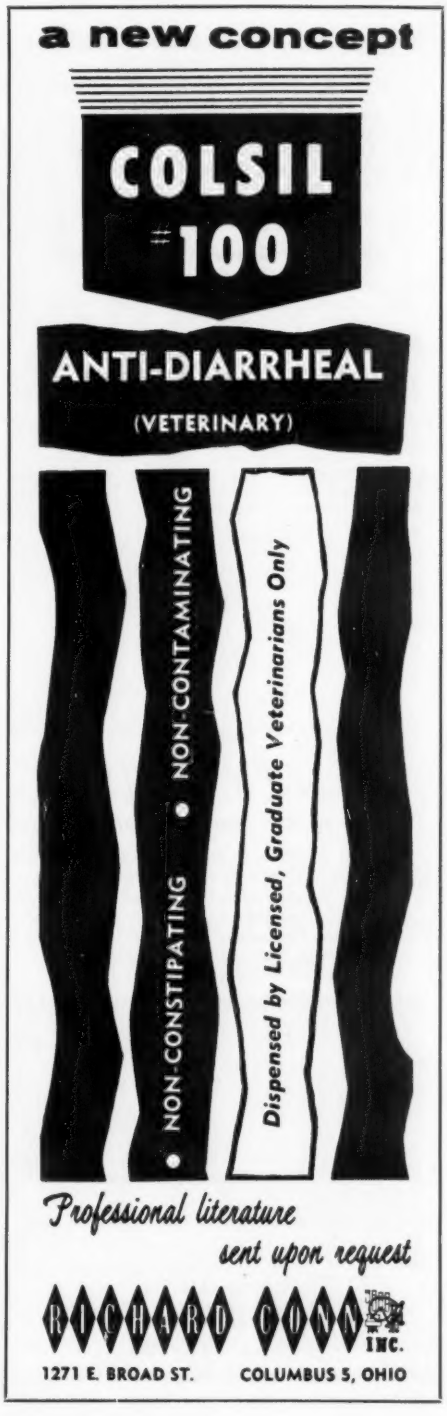

Coming Meetings—continued from adv. p. 39.

Twelfth World's Poultry Congress. Show Grounds of the New South Wales Royal Agricultural Society, Sydney, Australia, Aug. 13-18, 1962. Dr. Cliff D. Carpenter, chairman, U.S. Participation Committee, 1207 Emerald Bay, Laguna Beach, Calif.; Dr. A. William Jasper, secretary, c/o AFBF, 2300 Merchandise Mart, Chicago 54, Ill.

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Medical Association, the first Thursday of each month, Bonnie Crest Country Club, Montgomery, Ala. Dr. E. B. Rushing, Jr., Box 10275, U.S. Air Force Hospital, Maxwell Air Force Base, Ala.

Jefferson County Veterinary Medical Association, Inc., the second Thursday of each month, Homewood Elks Lodge, Birmingham, Ala. Dr. Marcus F. Martin, 1704 Centerpoint Rd., Birmingham, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of May, July, September, November, January, and March, Decatur, Ala. Dr. Ray Ashwander, Box 1767, Decatur, Ala., secretary.

Southeast Alabama Veterinary Medical Association, the second Sunday afternoon of January, April, July, and October, Rawls Hotel, Enterprise, Ala. Dr. J. B. Taylor, P.O. Box 96, Elba, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month, 8:00 p.m. Dr. Stanley M. Teeter, 5036 N. 51st Ave., Phoenix, Ariz., secretary.

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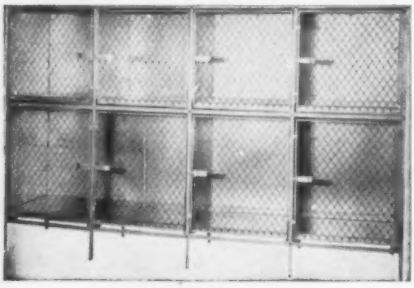

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CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the last Wednesday of each month. Dr. L. M. Proctor, 24 Meadow Lane, Concord, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Mr. Herb Warren, 3004 Sixteenth St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Dr. LeRoy Krum, P.O. Box 751, Fresno, Calif., secretary.

Humboldt-Del Norte Counties Veterinary Medical Association, the second Tuesday of January, May, September, and November, Eureka, Calif. Dr. M. Lunstra, P.O. Box 734, Eureka, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of each month. Dr. William Matulich, P.O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Dr. J. Todorovic, 47 Mann Ave., Watsonville, Calif., secretary.

Northern California Association of Veterinarians, the second Tuesday of each month. Dr. Robert N. Erickson, Rt. 3, Box 22, Chico, Calif., executive secretary.

Northern San Joaquin Veterinary Medical Association, the fourth Wednesday of each month. Hotel Covell, Modesto, Calif. Dr. Wilson Kelly, Rt. 3, Box 234, Lodi, Calif., secretary.

Orange County Veterinary Medical Association, the first Thursday of each month. Dr. Sam Fulton, 5422 Lincoln, Cypress, Calif., secretary.

Peninsula Veterinary Medical Association, the third Tuesday of each month. Dr. J. D. Wood, 2875 El Camino Real, Redwood City, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Thursday of each month, 8:00 p.m., Chuckwagon, Fulton & Marconi, Sacramento, Calif. Dr. Leonard P. Griffin, 2420 Wulff Lone, Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month, 7:30 p.m., Kings Inn, San Diego, Calif. Dr. Fred Sherman, 3954 Willowside Lane, Spring Valley, Calif., secretary.

San Francisco County Veterinary Association, the third Thursday of each month, Presidio, San Francisco, Calif. Dr. Norman Green, 2221 Taraval, San Francisco, Calif., secretary.

South California Veterinary Medical Association, the last Wednesday of each month, Hotel Mayfair, Los Angeles, Calif. Dr. H. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinary Medical Association, the second Thursday of each month. Dr. Robert A. Dove, P.O. Box 881, Porterville, Calif., secretary.

COLORADO—Denver Area Veterinary Medical Society, Inc., the fourth Tuesday of each month, American Legion Post #1, 1370 Broadway, Denver, Colo. Dr. Larry G. Ramsay, 2750 South Broadway, Englewood, Colo., secretary.

Northeastern Colorado Veterinary Medical Association, the first Friday of each month, Cactus Restaurant, Sterling, Colo. Dr. Don A. Ostwald, 630 Meeker St., Ft. Morgan, Colo., secretary.

DELAWARE—New Castle County Veterinary Medical Association, the second Tuesday of each month, Powder Mill Inn, Route 52, Greenville, Del. Dr. Arthur Paul Mayer, R.D. #2, Elkton Rd., Newark, Delaware, secretary.

(*Continued on adv. p. 42*)

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MEETINGS — continued from adv. p. 40

FLORIDA—Big Bend Veterinary Medical Association, the second Sunday of each month, Dining Room, Tallahassee, Fla. Dr. Robert E. Lee, M.S.S. Box 3236, Tallahassee, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of each month, 8:00 p.m., Green Turtle Restaurant, Phillips Highway. Dr. Edwin G. Clampett, 5150 Love Grove Rd., Jacksonville 7, Fla., secretary.

Northwest Florida Veterinary Medical Association, the third Wednesday of each month, 7:30 p.m., Chuckwagon, Pensacola, Fla. Dr. R. S. Hardwick, 804 New Warrington Rd., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month, 8:00 p.m., McArthur Dairy Bldg., 4 Points, W. Palm Beach, Fla. Dr. Jack Liggett, 4501 Broadway, W. Palm Beach, Fla., secretary.

Pinellas County Veterinary Society, the first Monday of each month except March, June, September, December, Fort Harrison Hotel, Clearwater, Fla. Dr. Leon H. Sellers, Jr., 3813 Tyrone Blvd., St. Petersburg, Fla., secretary.

Ridge Veterinary Association, the fourth Thursday of each month, John's Restaurant, Bartow, Fla. Dr. John C. Haromy, Rt. #1, Box 293, Lake Wales, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month, Nick & Arthurs Restaurant, Miami, Fla. Dr. G. E. Lanier, 20852 S. Federal Highway, Miami, Fla., secretary.

GEORGIA—Georgia-Carolina Veterinary Medical Association, the second Monday of each month, Town Tavern, Augusta, Ga. Dr. Charles R. Wallace, Physiology Department, Medical College, University of Georgia, Augusta, Ga., secretary.

Greater Atlanta Veterinary Medical Society, Inc., the third Thursday of each month, Elks Home on Peachtree St., Dr. Charles A. Greenig, 715 E. College Ave., Decatur, Ga., secretary.

South Georgia Veterinary Medical Association, the first Sunday of January, April, July, October. Dr. W. F. Schroeder, Animal Disease Department, Tifton, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month, 9 p.m., LaSalle Hotel, Chicago, Ill. Dr. Jack R. Dinsmore, 2400 Waukegan Rd., Glenview, Ill., secretary.

Kankakee Valley Veterinary Medical Association, the second Tuesday of February, May, August, and November, Kankakee, Ill. Dr. L. G. Gunning, 1940 West Station St., Kankakee, Ill., secretary.

Southern Illinois Veterinary Medical Association, the third Thursday of April, July, and October. Dr. Leland H. Holt, 2117 Johnson Rd., Granite City, Ill., secretary.

INDIANA—Calumet Area Veterinary Medical Association, the first Thursday of each month except July, August, December, and January, Wellman's Corral, Valparaiso, Ind. Dr. Bernard Meyerowitz, 1906 Calumet Ave., Valparaiso, Ind., secretary.

Wabash Valley Veterinary Medical Association, the third Wednesday of each month except January, August, and December, Honeywell Memorial Bldg., Wabash, Ind. Dr. Donald J. Meyers, R #5, Wabash, Ind., secretary.

IOWA—Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, Hotel Bradford, Storm Lake, Iowa. Dr. Vernon Walsh, Webb, Iowa, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, Loftus Restaurant or Boot Hill Supper Club, 6:30 p.m. Dr. M. F. Frevert, West Union, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the third Wednesday of each month, September through May, 7:00 p.m., Sheldon Iowa Country Club. Dr. Robert Wahl, Sibley, Iowa, secretary.

Southeast Iowa Veterinarians, the first Tuesday of each month except July, August, and January, Iris Court, Mt. Pleasant, Iowa. Dr. H. D. McCreedy, R #5, Bloomfield, Iowa, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday in April and October, Hotel Chiefton, Council Bluffs, Iowa. Dr. Floyd Sharp, Red Oak, Iowa, secretary.

Upper Iowa Veterinary Association, the third Tuesday of each month, Rock's, Clear Lake, Iowa. Dr. Norman Held, Box 185, Ventura, Iowa, secretary.

KANSAS—Central District Veterinary Medical Association, meetings irregular, next meeting September 10, 1961, McPherson, Kan. Dr. Ernest Boley, P.O. Box 1540, Wichita 1, Kan., secretary.

Sedgwick County Veterinary Medical Association, the third Thursday in February, May, and September plus months when special programs are planned. Dr. Ernest Boley, P.O. Box 1540, Wichita 1, Kan., secretary.

Western District of Kansas Veterinary Medical Association, meetings in April and October. Dr. L. E. Fairbairn, 402 Davis, Garden City, Kan., secretary.

KENTUCKY—Jefferson County Veterinary Society, the first Wednesday of each month except July and December. Dr. G. R. Comfort, 2102 Reynolds Lane, Louisville 18, Ky., secretary.

LOUISIANA—Calcasieu Parish Veterinary Medical Association, the first Tuesday of every second month, 8:00 p.m., Chateau-Charles, Lake Charles, La. Dr. Joseph E. Bruce, P.O. Box 506, Sulphur, La., secretary.

New Orleans Veterinary Medical Association, the fourth Monday of each month, Mouteleone Hotel. Dr. Roy Hock, 938 Esplande Ave., New Orleans, La., secretary.

Northwest Louisiana Veterinary Medical Association, fourth Wednesday of each month, Brocato's Stopmore Restaurant. Dr. John M. Rust, 9424 Mansfield Rd., Shreveport, La., secretary.

MAINE—Practitioners Round Table, the second Thursday of each month when state meetings are not held. Dr. Mary Smith, 973 Forest Ave., Portland, Me., secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month except June, July, and August, Park Plaza Hotel, Baltimore, Md. Dr. Dennis G. Foster, 7810 Wise Ave., Baltimore 22, Md., secretary.

MASSACHUSETTS—Boston Veterinary Association, the third Wednesday in February, April, May, November, and December, Angell Memorial Hospital. Dr. Harrison B. Seigle, 290 Bridge St., Dedham, Mass., secretary.

Southeastern Massachusetts Veterinary Medical Association, the first Wednesday of each month, Eugene's, Route 28, Middleboro, Mass. Dr. Ray Russo, Main St., Kingston, Mass., president.

Western Massachusetts Veterinary Association, the first Wednesday of March, June, September, and December. Dr. Douglas N. Stern, Paige Laboratory, University of Massachusetts, Amherst, Mass., secretary.

MICHIGAN—Midstate Veterinary Association, the second Thursday of each month, October through May. Dr. D. B. Coohon, 304 Milford, East Lansing, Mich., secretary.

Northern Michigan Veterinary Medical Association, the second Wednesday of February, April, September, and November. Dr. R. W. Waldby, R #5, Box 236N, Traverse City, Mich., secretary.

Oakland County Veterinary Medical Association, the second Thursday of September, November, January, March, and May. Dr. R. W. Huff, 1521 N. Woodward, Birmingham, Mich., secretary.

Southern Michigan Veterinary Association, the second Wednesday of each month. Rock Inn, Adrian, Mich. Dr. Ross Dean Scoggins, Hudson, Mich., secretary.

Southeastern Michigan Veterinary Medical Association, the fourth Wednesday of each month, September through May, Croation Catholic Center, 201 W. 7 Mile Rd., Detroit, Mich. Dr. S. R. Purvis, 13389 Farmington Rd., Livonia, Mich., secretary.

Thumb Veterinary Medical Association, the second Thursday of every other month beginning with February. Dr. H. B. Kraft, Browns City, Mich., secretary.

MINNESOTA—Southeastern Minnesota Veterinary Medical Society, the second Thursday of each month. Kahler Hotel, Rochester, Minn. Dr. Paul E. Zollman, 200 S.W. First St., Rochester, Minn., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month except July and August, Coronado Hotel, Lindell Blvd. and Spring St. Dr. H. C. Eschenroeder, 8088 Watson Rd., St. Louis 19, Mo., secretary.

Kansas City Veterinary Medical Association, the third Thursday of each month, Hotel President, Kansas City, Mo. Dr. Iain M. Paton, 12203 West 70 Terrace, Shawnee, Kan.

Southeast Missouri Veterinary Medical Association, the third Wednesday of April and September, all day. Dr. John R. Adams, 405 North St., Sikeston, Mo., secretary.

MONTANA—Yellowstone Veterinary Medical Association, the second Thursday of each month, Turf Penthouse, Billings, Mont. Dr. B. Hubbell, Jr., 50 Moore Lane, Billings, Mont., secretary.

NEBRASKA—District IV Nebraska Veterinary Medical Association, the third Thursday of each month, 7:00 p.m., Jack's Cafe, Columbus, Neb. Dr. J. L. MacKinnan, Platte Center, Neb., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May, Old Hights Inn, Highstown, N.J. Dr. John W. Flemer, P.O. Box 191, Princeton, N.J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday of each month, October through April, except December, the Coronet, Irvington, N.J. Dr. Henri March, Verona, N.J., secretary.

North West Jersey Veterinary Society, the third Wednesday of every odd numbered month, 8:00 p.m., Minton's Restaurant, Stanhope, N.J. Dr. Robert A. Moore, RD. 1, Box 657, Branchville, N.J., secretary.

Southern New Jersey Veterinary Medical Association, the fourth Tuesday of each month, Collmont Diner, Collingswood, N.J. Dr. Jay Simmons, 247 S.W. H. Pike, Audubon, N.J., secretary.

NEW MEXICO—Bernalillo County Veterinary Practitioners Association, the fourth Tuesday of each month, 12:30 p.m., Fez Club, Alburquerque, N.M. Dr. James

(*Continued on adv. p.* 48)

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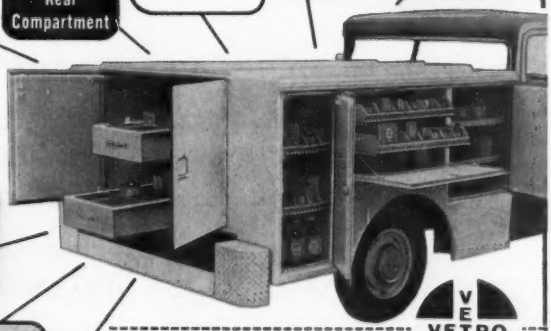

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Where to Locate a Lost Lady at the AVMA's Annual Meeting in Detroit Aug. 20-24, 1961

Women, experts tell us, have their own way of enjoying their husbands' convention. Window shopping, for instance, and comparing prices in the convention city with those at home. So in case your wife isn't in the room when you return to the hotel after a scientific session, search 1st in Detroit's downtown shopping district, an area about 5 blocks long and 4 blocks wide, north of City Hall. But since the area contains some 800 stores—86 varieties of department and specialty shops—we will furnish you with a list of the better-known firms to make it easier for you—and your wife.

Pictured above is an air view of the exclusive New Center Shopping District just outside the Loop in Detroit, Michigan.

We advise you to start out with J. L. Hudson's, one of the world's 2 largest department stores, both in total area and in volume of sales. It has 14 selling floors, each a full city block, and more than 300 departments. On its men's and women's clothing floors, there are 706 fitting rooms. Its basement store is the world's largest—so big it has its own basement and branches at 3 other locations.

Also within walking distance of the hotels are the large specialty shops for men's and women's apparel: Himelhoch Bros., Inc.; B. Siegel's; D. J. Healy's; and Annis Furs and Fashions, catering to all price brackets. At Winkelman's, Franklin (Simon's New York offshoot), Hughes, and Hatcher-Harry Suffrin's, equal emphasis is put on fashion and budget limitations.

The small exclusive downtown women's shops where one finds expensive originals and imports in abundance are Irving's, on West Adams; Florice's, on Washington Blvd.; Marge Fischer's International Shop, also on the boulevard; Kay Cooley's in the Hotel Statler, and Peck and Peck in the David Whitney Building.

The largest exclusively-jewelry stores downtown are Warren's and Wright-Kay in the high-prices category and Meyer's and Sallan's for a varied price range. Not to be overlooked is the R. H. Fyfe Co., the world's largest store devoted entirely to footwear where everyone from Grandpa to the newest addition to the clan can be fitted somewhere on its 7 floors. Fyfe's was founded on its corrective shoe trade and still fits the difficult cases.

With a half-day to kill and a dollar cab fare, one can shop the New Center district

just outside the Loop. Here you find a concentration of the town's most exclusive and expensive shops.

Saks-Fifth Avenue, the Detroit branch of Manhattan's famous concern, carries most of the merchandise found in the parent shop.

In the Fisher Building, across the street from Saks, the Julie Shop and Milgrim's have all the name lines of the European and American coutures—at the high-fashioned prices.

L. B. King's is devoted exclusively to fine china and glassware. It is an old Detroit firm and an expensive one, but the shrewd shopper can ferret some budget-type items. Delman Shoe Salon is across from the Fisher Building on West Grand Blvd. It carries 2 price lines, one high and the other low but not cheap, in addition to the high-styled models of David Evins and Christian Dior. There also is a downtown Delman's next door to Irving's on East Adams.

Just beyond the New Center district (give or take a kilometer or 2) one will find within walking distance of one another, several of the city's oldest antique shops. Mary Bagley's (11542 Woodward) is best known and thoroughly reliable.

Four of Detroit's most famous and most colorful shopping areas are about $3 cabtab (one way) away from the Loop. One should count on spending at least 4 or 5 hours exploring them. In each there are good restaurants, small and large, simple and elaborate.

Above is Northland, located at Northwestern Highway and Eight Mile Road in Detroit. Northland is the world's largest regional shopping center.

Northland, at the intersection of Northwestern Highway and Eight Mile Road, is the world's largest regional shopping center. It has 70 stores clustered around the J. L. Hudson branch store in a picturesque setting of fine contemporary buildings, beautiful gardens and malls, dotted with fine modern sculpture.

Although the shops are varied as to merchandise and prices, their general appeal is to the middle-class family. The same is true of Eastland, a similar but newer and a bit smaller shopping center set up on the opposite side of town at Kelly and Eight Mile.

Good luck to you in your search. O yes, you may want to clip this article and give it to your wife. She will love you for it.

Avoid Delay—Register in Advance

AVMA Annual Meeting August 20-24, 1961

You can beat the crowds in Detroit and avoid delays in long registration lines this year. For the first time in many years, the AVMA encourages you to register your attendance in advance. The pre-registration form appears on page 49 of this issue. Just fill it out and submit it and your payment to the AVMA office. We will do the rest for you!

When you get to Cobo Hall, all you need to do is pick up your Convention Kit. Your badges, program, and tickets will be ready to go.

Be sure that your hotel reservations, too, are made in advance. A reservation request appears on page 53.

Avoid Delay—Register in Advance

MEETINGS — continued from adv. p. 43

Wehrman, 3018 Rio Grande Blvd., N.W., Albuquerque, N.M., secretary.

NEW YORK—Finger Lakes Veterinary Medical Society, the third Wednesday of each month, Colonial Inn, Canandaigua, N.Y. Dr. Joseph Ferris, Holcomb, N.Y., secretary.

Hudson Valley New York Veterinary Medical Society, the second Wednesday of February, May, August, November. Dr. W. S. Stone, 15 Highland Dr., E. Greenbush, N.Y., secretary.

Long Island Veterinary Medical Association, Inc., the third Thursday of each month, September through May. Dr. J. Asmus Sutorius, 11 Fairway W., Sayville, N.Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even numbered months except August, Monroe County Health Department. Dr. Irwin Bircher, 40 Meredith St., Rochester 9, N.Y., secretary.

Southern Tier Veterinary Medical Association, the fourth Thursday of January, April, July, and October. Dr. Donald W. Baker, New York State Veterinary College, Cornell University, Ithaca, N.Y., secretary.

Veterinary Medical Association of New York City, Inc., the first Wednesday of each month, October through June, 8:00 p.m., New York University Medical Center, 550 First Ave., New York, N.Y. Dr. Irving Zimmerman, 9 West 75th St., New York 23, N.Y., secretary.

Western New York Veterinary Medical Association, July 13, 1961, Sheraton Hotel, Buffalo, N.Y. Dr. F. E. McClelland, Jr., 455 Ellicott St., Buffalo 3, N.Y., secretary.

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NORTH CAROLINA—Central Carolina Veterinary Association, the second Wednesday of each month, O'Henry Hotel, Greensboro, N. Car. Dr. W. A. Sumner, 3741 High Point Rd., Greensboro, N. Car., secretary.

Eastern North Carolina Veterinary Medical Association, the last Tuesday of each month. Dr. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Wednesday of each month, Moose Club, Hickory, N. Car. Dr. B. F. Sherwood, Rt. 3, Boone, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Friday of each month, 7:30 p.m., Orange Bowl Restaurant, Rockingham, N. Car. Dr. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

OHIO—Cincinnati Veterinary Medical Association, the first and third Tuesday of each month, Shuller's Wigwam, Hamilton Ave., Cincinnati, Ohio. Dr. Jerry Theobald, Tennessee and Reading Rds., Cincinnati 29, Ohio, secretary.

Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, Sheraton Hotel, Cleveland, Ohio. Dr. B. K. Brown, 2573 Wooster Rd., Rocky River 16, Ohio, secretary.

Geauga County Veterinary Society, the second Wednesday of each month, at noon, Manor House, Newbury, Ohio. Dr. Peter Clemens, RFD #2, Chagrin Falls, Ohio, secretary.

Madison County Veterinary Association, meetings irregular. Dr. James E. Herman, London Animal Hospital, London, Ohio, president.

Mahoning County Veterinary Medical Association, the fourth Tuesday of each month, Chicone's Restaurant, 1108 McGuffey Rd., Youngstown, Ohio. Dr. R. J. Edwards, 234 Fifth Ave., Youngstown, Ohio, secretary.

South Central Ohio Veterinary Medical Association, the second Thursday of months when called, Jo-Kar Restaurant, Lancaster, Ohio. Dr. J. M. Hagely, 1624 E. Main, Lancaster, Ohio, Secretary.

Stark County Veterinary Medical Association, the third Tuesday of each month, Skyway Room, 2720 Fulton Rd., N.W., Canton, Ohio. Dr. Robert J. Kilgore, 5165 Echo Valley St., N. Canton 20, Ohio, secretary.

Toledo Veterinary Medical Association, January, April, July, and October. Dr. Donald R. Knepper, Rt. 1, Maumee, Ohio, secretary.

West Central Veterinary Medical Association, the third Thursday of February, June, September, and November, Alpine Village, Lima, Ohio. Dr. K. R. Heidt, 1055 Spencerville Rd., Lima, Ohio, secretary.

OKLAHOMA—Tulsa Association of Small Animal Veterinarians, the first Monday of each month, Tulsa City-County Health Bldg., Tulsa, Okla. Dr. Robert Lawrence, 3837 S. Sheridan, Tulsa 29, Okla.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month except June, July, and August, Ireland's at Lloyd's Restaurant, 718 N.E. 12th Ave., Portland, Ore. Dr. Forris B. Frick, 8415 S.E. McLouglin Blvd., Portland 2, Ore., secretary.

Willamette Veterinary Medical Association, the third Tuesday of each month, October through June, Salem, Ore. Dr. E. L. Henkel, 803 Oak St., P.O. Box 155, Silverton, Ore., secretary.

PENNSYLVANIA—Capital City Vetetinary Medical Association, the second Thursday of odd numbered months, Colonial Country Club. Dr. P. H. Seitz, P.O. Box 403, Harrisburg, Pa., secretary.

(*Continued on adv. p. 50*)

AVOID THE CROWDS!

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THE 98th ANNUAL MEETING OF THE AVMA
AUGUST 20-24, 1961
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AVMA members and their guests	**$ 8.00 each**
Wives of AVMA members	**$ 5.00 each**
Children	**$ 3.00 each**
Nonmembers and guests	**$15.00 each**
Alumni Dinner Tickets	**$ 5.00 each**

(Alumni Dinners will be held on Tuesday, August 22)

NOTE: Wives and children must be registered only if they will participate in women's, teens, or subteens' programs. Advance registration closes August 1, 1961. Refunds will be made only if request is received prior to August 7, 1961. Hotel reservations must be made by individual.

Cut on Dotted Line and Return to AVMA, 600 S. Michigan Ave., Chicago 5, Illinois

For ADVANCE REGISTRATION: 98th ANNUAL MEETING OF THE AVMA
August 20-24, Detroit, Michigan

Please register me and others named below in advance and furnish receipt. My check for $_____ is enclosed.

Name (please print) _____

Complete Address _____

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Guest's Name (s) _____ Children's names and ages

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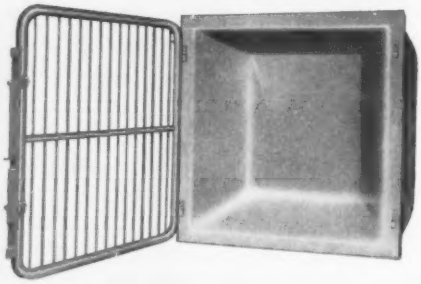

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MEETINGS — continued from adv. p. 48

Conestoga Veterinary Medical Association, the third Friday of each month, September through May, 8:30 p.m., Exchange Room, Union Stock Yards, Lancaster, Pa. Dr. I. M. Saturen, R.D. 2, Willow St., Pa., secretary.

Keystone Veterinary Medical Association, the fourth Wednesday of each month, October through May, University of Pennsylvania, School of Veterinary Medicine. Dr. Jacob L. Kolodner, 7921 Rodgers Rd., Philadelphia, Pa., secretary.

Northwestern Pennsylvania Veterinary Medical Association, the second Wednesday of January, April, July, October. Dr. Arthur Richards, Jr., Box 528, Grove City, Pa., secretary.

Penn-Allegheny Veterinary Club, the third Thursday of odd numbered months, Wissinger's Inn, Ebensburg, Pa. Dr. S. B. Guss, Veterinary Science Bldg., University Park, Pa., secretary.

TENNESSEE—East Tennessee Veterinary Medical Association, the second Saturday of December, May, June, September. Mrs. J. W. Roberts, Ridge Rock Rd., Knoxville, Tenn., secretary.

TEXAS—Harris County Veterinary Medical Association, the first Thursday of each month, 8:00 p.m., Baylor Medical School. Dr. J. P. Robisheaux, 2919 S. Wayside, Houston 23, Texas, secretary.

Tarrant County Veterinary Medical Association, the third Thursday of each month, 7:30 p.m., Cattlemans Steak House, Ft. Worth, Texas. Dr. Putnam, Berry St. Animal Hospital, Ft. Worth, Texas, secretary.

VIRGINIA—Northern Virginia Veterinary Conference, the second Wednesday of each month, Lee-Jackson Restaurant, Winchester, Va. Dr. T. P. Koudelka, P.O. Box 694, Harrisonburg, Va., secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month, Veterinary Science Laboratory, Virginia Polytechnic Institute, Blacksburg, Va. Dr. D. F. Watson, Department of Veterinary Science, Virginia Polytechnic Institute, Blacksburg, Va., secretary.

WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Wednesday of March, June, September, and December. Dr. E. D. Baker, 1418 LaSalle Ave., Barron, Wis., secretary.

Coulee Region Veterinary Medical Association, the third Wednesday of odd numbered months, Sparta, Wis. Dr. F. N. Petersen, Box 127, Cashton, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month, September through May. Dr. James D. Russell, 4001 N. Sherman Ave., Madison, Wis., secretary.

Milwaukee County Area Veterinary Medical Association, the third Tuesday of each month. Dr. R. G. Pahle, 10827 W. Oklahoma Ave., West Allis 19, Wis., president.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday of April and September. Dr. William Madson, 218 E. Washington St., Appleton, Wis., secretary.

Southeastern Wisconsin Veterinary Association, the third Thursday of each month. Dr. J. Robert Curtis, 419 W. Cook St., Portage, Wis., secretary.

Southwestern Wisconsin Veterinary Medical Association, the first Thursday of even numbered months. Dr. Ralph E. Day, Platteville, Wis., secretary.

Waukesha County Veterinary Medical Association, the second Wednesday of every other month. Dr. P. B. Swort, Route 2, Waukesha, Wis., secretary.

Listings not received in time for publication in this issue of the JOURNAL will be carried in the July 1 issue.

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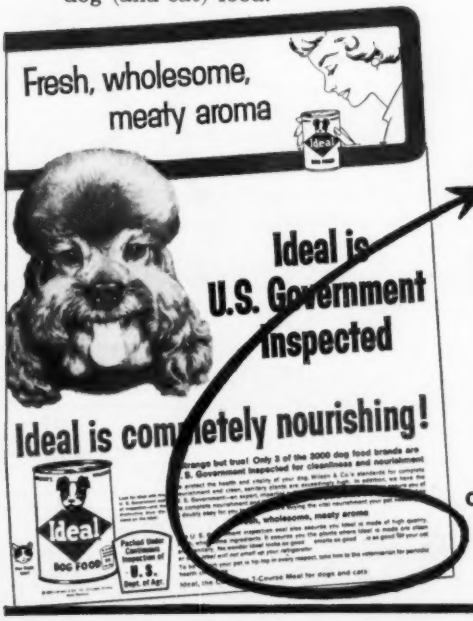

The third important assurance of good health for dogs & cats is *YOU*. This is how Ideal encourages pet owners to rely on *all three:*

"To be certain your pet is tip-top in every respect, take him to the veterinarian for periodic health check-ups"

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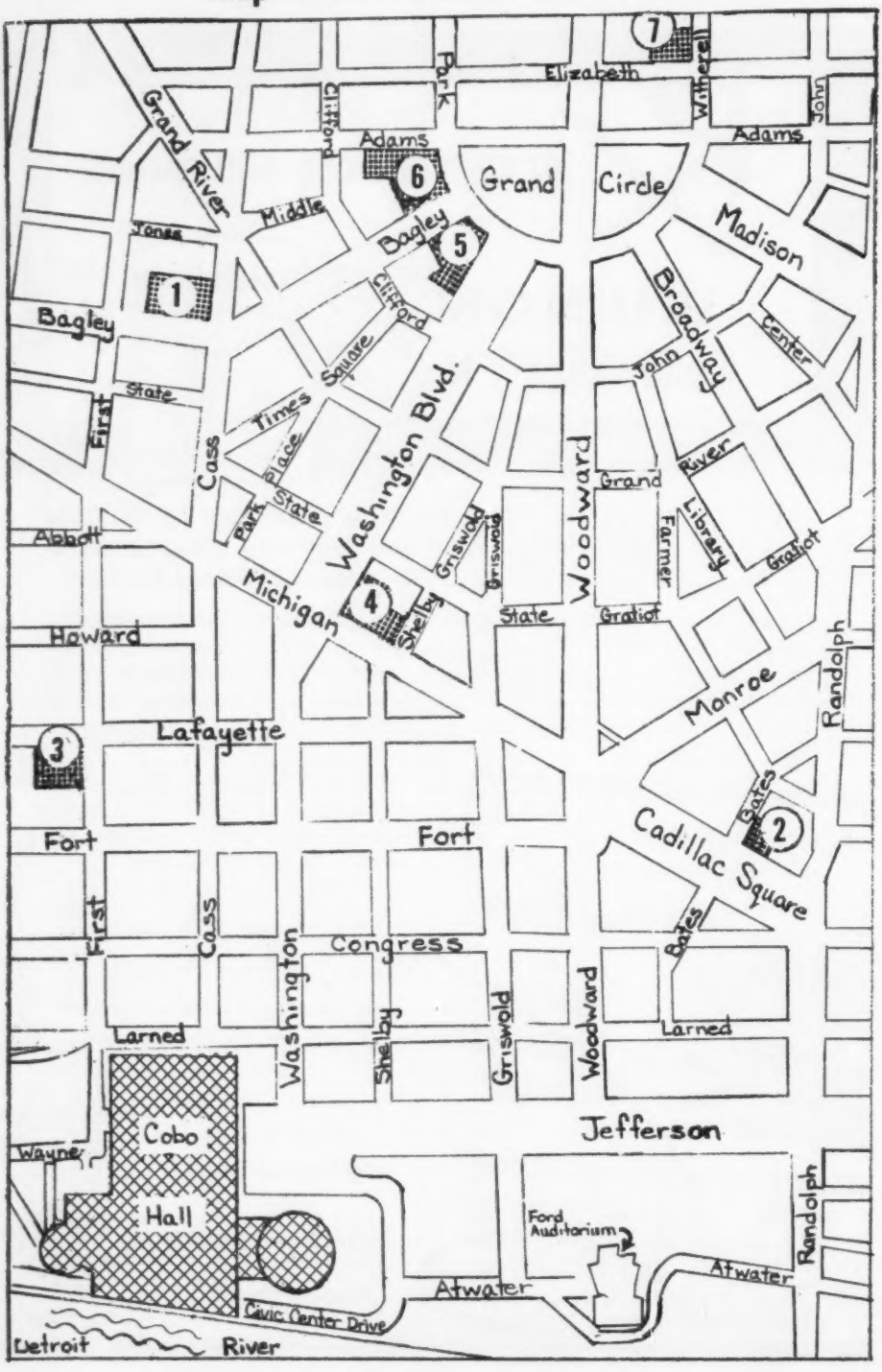
Chicago, Illinois — Meat Packers

Map of Downtown Detroit



ANNUAL MEETING HOTEL RESERVATION REQUEST

American Veterinary Medical Association

Detroit, Michigan - August 20-24, 1961

INSTRUCTIONS AND INFORMATION

Please give ALL of the information requested below and mail this form to the Detroit Convention and Tourist Bureau. All reservations must be cleared through the Housing Bureau.

Blocs of rooms have been allocated for our use in the hotels which are listed. The Housing Bureau must have the names of all the persons who will occupy each room. No bloc reservations will be made.

Placement will be made in the order received. Your choice of hotels will be followed if rooms are available. Otherwise, assignment will be made to best possible advantage elsewhere. You will receive a confirmation directly from the hotel. (NOTE: All rates are subject to change.) If you desire accommodations in a Detroit hotel not listed or a motel, please so indicate. The Housing Bureau will try to place you there.

FAMILY PLAN — The hotels listed offer a "family plan" whereby children under 14 years of age will be accommodated in the same room with their parents at no extra charge. If more than one room is required to accommodate children, the hotel will charge only the single rate for each additional room.

ANNUAL MEETING HOTELS

Hotel	Singles	For Two Persons		Suites	
		Doubles	Twins	1 Bedroom	2 Bedrooms
1 Detroit-Leland	$7.50-13.50	$10.50-16.00	$12.00-19.00	$25.00-35.00	$38.50-50.50
2 Henrose	6.50-10.50	9.00-13.50	12.50-16.00	25.00	45.00
3 Pick-Fort Shelby	6.00-12.75	9.00-15.50	10.50-16.25	23.00-43.50	39.75-58.75
4 Sheraton-Cadillac (Headquarters Hotel)	8.50-18.00	14.35-20.50	14.85-23.00	29.00-37.50	46.00-56.00
5 Statler Hilton	7.00-13.50	12.50-17.00	14.00-24.50	38.00-44.00	59.50-97.00
6 Tuller	5.00- 9.00	9.00-12.00	10.50-15.00		
7 Wolverine	6.00- 9.00	8.50-10.00	11.00-18.50	25.00	35.00-45.00

APPLICATION FOR HOTEL ACCOMMODATIONS

MAIL TO: Housing Bureau, AVMA
Detroit Convention and Tourist Bureau
626 Book Building
Detroit 26, Michigan

CHOICES OF HOTELS: 1st CHOICE: HOTEL _____ 2nd CHOICE: HOTEL _____

3rd CHOICE: HOTEL _____ 4th CHOICE: HOTEL _____

ACCOMMODATIONS DESIRED: RATE DESIRED:

_____ Room(s) with one bed for one person (Single) $ _____ to $ _____

_____ Room(s) with twin beds for two persons (Twin) $ _____ to $ _____

_____ Room(s) with one bed for two persons (Double) $ _____ to $ _____

_____ Suite(s) parlor and one bedroom $ _____ to $ _____

_____ Suite(s) parlor and two bedrooms $ _____ to $ _____

ARRIVAL TIME: Date _____ Hour _____ DEPARTURE TIME: Date _____ Hour _____

LIST NAMES OF ALL PERSONS WHO WILL OCCUPY EACH ROOM:

Name	Street Address	City and State

CONFIRM RESERVATION TO: NAME _____

NAME OF COMPANY _____

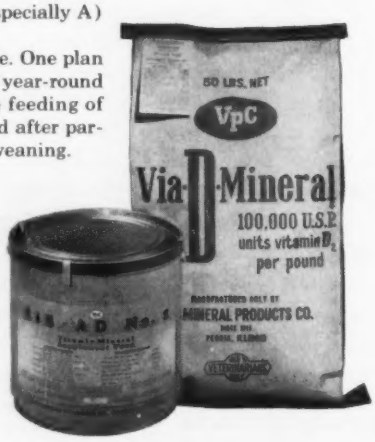
STREET ADDRESS _____

CITY _____ ZONE _____ STATE _____

NOW—YOUR CLIENTS CAN SAVE MORE CALVES

Calf losses on many farms total up to 20%. Records show that the highest incidence is in those herds that are heavily fed on concentrates, milked up to their maximum yield, and where the feeding of sufficient minerals and vitamins (especially A) has been neglected.

It is claimed much calf mortality is preventable. One plan endorsed by many prominent veterinarians is the year-round feeding of a Vitamineral Supplement—plus the feeding of VpC RIBAD II to the dam for 60 days before and after parturition and to the calf the first few weeks after weaning.



This supplemental feeding supplies the major elements of calcium and phosphorus; such trace elements as iodine, cobalt, iron, copper, zinc, manganese and others; plus vitamins A, D_2, D_3 and Riboflavin. Seems to promote more stamina in the dam for producing more potent colostrum for the calf. This feeding plan is worthy of your consideration.

Write for literature and prices.

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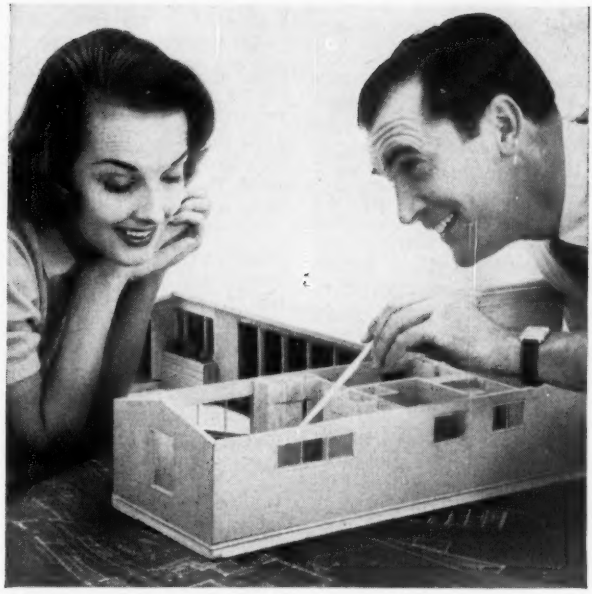

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Saving for a new home, or anything else in fact, is simply a matter of spending less than you earn. Thousands of Americans have found an automatic way: the Payroll Savings Plan where they work. Through this plan your payroll clerk sets aside a certain amount each payday for U.S. Savings Bonds. As little as $1.25 a day buys a $50 Bond a month (cost $37.50). In 5 years you'll own Bonds worth $2,428.00—enough for a down payment and closing costs.

Six nice things about U.S. Savings Bonds

• You can save automatically on the Payroll Savings Plan or buy Bonds at any bank • You now earn 3¾% to maturity, ½% more than ever before • You invest without risk • Your Bonds are replaced free if lost or stolen • You can get your money with interest anytime you want it • You save more than money—you buy shares in a stronger America.

You save more than money with U.S. Savings Bonds

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20th ANNIVERSARY 1941 1961

Farm Facts

Between the years 1954 and 1959, 1,000,000 farms disappeared from the United States. But nearly 3/4 of these were farms with less than 69 acres; 70% were small farms in 16 southern states. A fourth of these 1,000,000 farms disappeared because of a change in the census definition of a farm, so that in reality this was a "paper loss." And 232,000 places under 10 acres are not counted as farms any more.

The farms that sold less than $2,500 annually declined rapidly, dropping 39% from 2.7 million in 1954 to 1.6 million in 1959. Farms of 99 acres or more declined only 10%, while farms of less than 99 acres declined 33%. About 794,000 farms, 21% of the total, sold $10,000 or more of farm products in 1959, an increase of 36% over 1954. Nearly 40% sold more than $5,000 worth in 1959. The average size farm is now 302 acres, up from 242 acres in 1954.

Farm sizes nearly doubled in the last 25 years. More farmers are farming their own land, and only 20% of the farms were operated by tenants in 1959, less than half of what it was in 1935 and the lowest for any year since 1880. There were only 121,000 sharecroppers in the South in 1959. In 1930 there were 776,000.

The average value of land and buildings per farm was $33,242 in 1959. This is an increase of 63% over 1954 and is 6 times higher than in 1940. Average value per acre of farm land and buildings in 1959 was $121.00, up from $84.00 in 1954.

More and more farmers are supplementing farm income with nonfarm work. Three out of 10 operators worked 100 or more days a year off their own farms in 1959 and 1.3 million of these operator-families, or 36%, made more from off-farm work than the value of the farm products they sold.

In 1959, almost 2/3 of all farms had telephones, more than half had home freezers, 7 out of 10 had tractors, 3 out of 10 had 2 or more tractors, 3 out of 5 had trucks, 4 out of 5 had cars, and 1 out of 4 had a combine. In 1954 to 1959, the expenditures per farm increased 21% for feed, 12% for hired labor, 24% for machine hire, and 13% for gasoline and other petroleum products.—*Farm J. March, 1961): 14.*

California Mastitis Program Extended to 540 Herds

The cost of mastitis to California dairymen is approximately $35,000,000 a year. About 50% is believed to be caused by faulty functioning of milking machine equipment. In 1960 an attempt was made by California extension personnel to combat these losses by enrolling 540 dairy herds comprising approximately 84,301 cows in mastitis control programs.—*Ann. Rep. Univ. California Agric. Exten. Serv., 1960.*

Eliminate VPP and AR from Swine Without Surgery

A program was undertaken to eradicate atrophic rhinitis and virus pig pneumonia from the Cornell University swine herd. The pigs were removed from their dams immediately after natural births and raised in strict isolation from swine with atrophic rhinitis virus pneumonia. Of 91 snouts and lungs examined from the main herd over a 2-year period, 8 and 31 have been diagnosed positive for atrophic rhinitis and virus pneumonia, respectively, as compared with 0 and 0 out of 39 from the group raised in isolation.

This data lends further support to the theory that these 2 diseases are spread only by direct contact of infected and susceptible swine. This trial indicated that atrophic rhinitis and virus pig pneumonia could be eliminated from a swine herd under reasonably practical conditions.—*J. Anim. Sci., 20, (Feb., 1961): 91.*

CLASSIFIED ADVERTISEMENTS

PERSONAL WANT ADS—$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

TOTAL WORD COUNT must include complete box number address (7 words) or personal address line.

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DEADLINES

1st of month issue — 8th of month preceding date of issue.

15th of month issue — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

Wanted—Veterinarians

Wanted—veterinarian to run modern small animal hospital in central Kentucky. Apply only if capable and willing to do a good job. Good possibility of becoming a partner. Address Box F 62, JOURNAL of the AVMA.

Wanted—veterinarian for Detroit small animal hospital. Write qualifications and starting salary. Address Box F 61, JOURNAL of the AVMA.

Wanted—California-licensed veterinarian to work in small animal hospital in southern California. Partnership or possible sale to right man. Address Box F 60, JOURNAL of the AVMA.

Wanted—young veterinarian to assist in active small animal hospital in San Francisco. Salary depending on experience. Percentage could be offered in the future. Address Box F 59, JOURNAL of the AVMA.

Wanted—veterinarian for small animal practice in the east bay area of California. Address Box F 57, JOURNAL of the AVMA.

Wanted—veterinarian for small animal practice near New York City. Position suitable for new or recent graduate. Good hours; salary open. Address Box F 53, JOURNAL of the AVMA.

Wanted—assistant for mixed practice in central California. Available no later than August 1. Address Dr. L. J. Barger, 1650 Bette St., Merced, Calif.

Wanted—licensed veterinarian for staff of completely-equipped, modern, AAHA small animal hospital in New York City suburb. Complete details in first letter. Address Box D 56, JOURNAL of the AVMA.

Wanted—veterinarian with Virginia license as assistant for modern small animal practice. Salary commensurate with ability. Substantial future. Address Box F 14, JOURNAL of the AVMA.

Opening for experienced associate veterinarian in small animal hospital in western Connecticut. Must be good diagnostician, progressive, capable of handling large practice. Starting salary—$12,000. Annual increments and bonuses. Address Box F 3, JOURNAL of the AVMA.

Wanted—Positions

Veterinarian with 15 years in general practice including experience with industrial livestock damage problems, desires position with industry, drug firm, or private field. Address Box F 58, JOURNAL of the AVMA.

Veterinarian with 16 years' experience in mixed practice desires opportunity in extension work, small animals, or zoo practice in southeastern states. Address Box F 56, JOURNAL of the AVMA.

Veterinarian, Ph.D., Bacteriology, experienced in veterinary and medical virology and in cell culture work; research publications; desires position, academic or commercial, with opportunities for research. Address Box F 50, JOURNAL of the AVMA.

Position wanted as animal house veterinarian. Research and testing of laboratory animals. Experienced. Also experienced in general practice. Address Box F 16, JOURNAL of the AVMA.

Position with future in small animal or mixed practice, or purchase same, desired by young married veterinarian. Licensed in Colorado, Wyoming, California and Kansas. Address Box E 69, JOURNAL of the AVMA.

For Sale or Lease—Practices

For lease—Veterinary hospital with well-shaded boarding runs on southeastern Florida coast. Address Box F 55, JOURNAL of the AVMA.

For sale—well-established small animal hospital with living quarters in the fastest-developing part of New Jersey. Owner wishes to retire. Address Box F 54, JOURNAL of the AVMA.

For sale—New Jersey, Bergen county, small animal practice, excellent opportunity. Address Box F 52, JOURNAL of the AVMA.

For sale—established small animal practice in Cleveland, Ohio, suburb. Good lease available. Other interests necessitate sale. Address Box F 51, JOURNAL of the AVMA.

For sale—completely equipped small animal practice in exclusive Denver suburb, located in foothills a short distance from mountain recreation. House, hospital, kennel combination. Price—$48,500 with $15,000 down. Address Box E 17, JOURNAL of the AVMA.

For sale—established small animal practice. Light horse work available. Heart of Bergen County, N.J. Unique opportunity. Address Box D 16, JOURNAL of the AVMA.

For sale—2-year-old modern small animal clinic in Chicago area. Reasonably priced for quick sale. No real estate. Address Box F 17, JOURNAL of the AVMA.

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For sale—northeastern Indiana hospital equipped for large and small animals including chute and x-ray. Good mixed practice. Frontage on state highway. Price reasonable. Address Box F 20, JOURNAL of the AVMA.

For sale or lease—mixed practice in prosperous rural area of eastern New York State. Gross—$23,000. Hospital and real estate. Capital required. Address Box F 22, JOURNAL of the AVMA.

For sale—large animal practice in Iowa county seat town with large public hospital. Pavement 6 ways. Priced at real estate value. Address Box F 24, JOURNAL of the AVMA.

Need good practices to sell in the Southwest. Professional service for the professions. Licensed and bonded, Charles E. Doyle, D.V.M., Practice Broker, 4813 N. McArthur, Oklahoma City, Okla.

For sale—large animal practice in eastern Iowa county seat town with pavement 4 ways. Priced at real estate value. Address Box E 74, JOURNAL of the AVMA.

Wanted—Practices

Wanted to buy or lease—small animal or mixed practice, preferably in California, by Colorado graduate with 6 years' experience. Have California license. Address Box F 26, JOURNAL of the AVMA.

Miscellaneous

Will pay $15 for spinal cord of cow dead of milk fever or its complications. Send case history. Address Dr. Max Unger, 1465 Broadway, New York 36, N.Y.

For sale—portable Profexray machine and equipment. Price—$250. Address or call Mrs. C. B. Hathaway, Butler, Ind.

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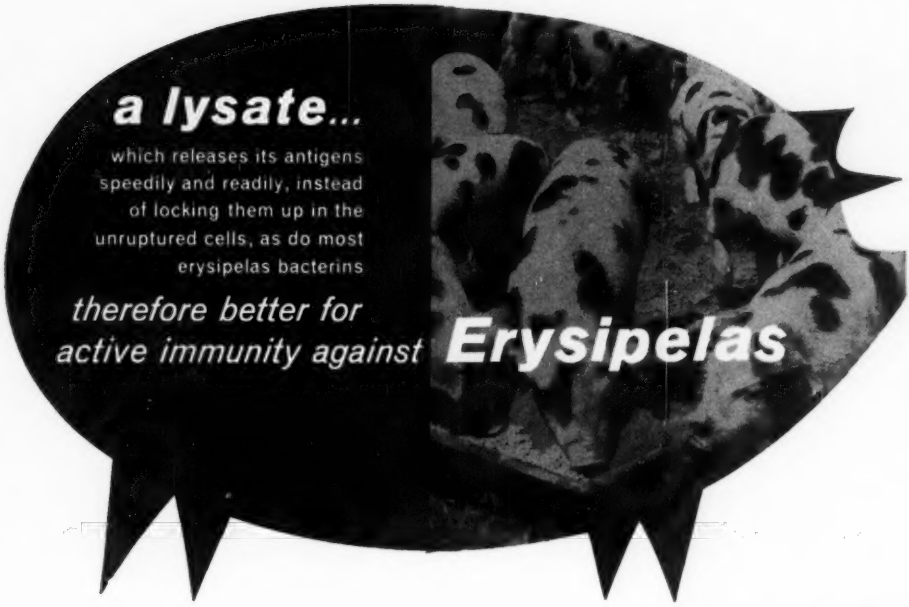
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which releases its antigens speedily and readily, instead of locking them up in the unruptured cells, as do most erysipelas bacterins
therefore better for active immunity against Erysipelas

RHUSIGEN*

With Rhusigen, the use of live culture is avoided and premises cannot be infected.

A 2 cc. dose is used instead of the 5 cc. required by other bacterins. Immunity is produced within two weeks, and persists for at least eight months, possibly longer.

Rhusigen can be used simultaneously with anti-swine-erysipelas serum, when immediate protection is needed.

20 cc. vial (10 doses) code: Baryp

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Indianapolis 6, Indiana

*Trademark name for Erysipelas Bacterin (Lysate) P-M Co. Bio. 914. Produced under license from the Institut Merieux, Lyon, France. (Patent Pending)

In Your Distemper Immunization Program

"Be Cytogen® Sure"

Cytogen: Canine Distemper Vaccine, Modified Live Virus, Canine Tissue Culture Origin, Lyophilized . . . the first modified live virus vaccine produced on dog kidney cells.

1 Be sure of high antigenicity:

To the recognized superiority of a modified live virus vaccine, **Cytogen** adds increased effectiveness where it counts most . . . the strength, quality and antigenicity of the virus itself. As little as ten egg infectious doses of **Cytogen** virus protected susceptible pups from direct challenge[1]. By comparison, 64 to 250 $E.I.D._{50}$ of chick embryo origin virus are required to confer immunity[2].

2 Be sure of rapid response:

When distemper virus is grown in the Jen-Sal canine kidney cell system and becomes **Cytogen** virus, its ability to invade the dog is also enhanced. Susceptible test animals successfully withstood challenge with virulent virus as early as four days after vaccination with **Cytogen**[3].

3 Be sure of maximum stability:

Cytogen contains an exclusive stabilizing agent. With this stabilizer **Cytogen** virus has successfully protected dogs from virulent virus challenge after being artificially aged for a period equivalent to fourteen months of storage at room temperature[4]. For even greater superiority **Cytogen** is held well below freezing from the time it is produced until you receive it.

Cytogen is now available for immediate shipment from your Jen-Sal branch. Order now and "Be **Cytogen** Sure."

Package: 10 — 1 dose vials, with diluent

Clinical and Research References:

1. Sinha, S. K., et al, Studies on Canine Distemper Immunization with a Tissue Culture Vaccine. Vet. Med., Vol. 55, No. 4, April 1960.
2. Burgher, J. A., et al, The Immune Response of Dogs to Distemper. Cornell Vet., Vol. 48, No. 2, 1958.
3. Paton, I. M., et al, Progress in Distemper Immunization. Jen-Sal Small Animal Topics, August 1960.
4. Dept. of Biological Research, Jensen-Salsbery Laboratories. Unpublished Research Data.

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